

HISTORICAL DEVELOPMENT OF VISAKHAPATNAM REGIONAL CENTRE OF CMFRI AND ITS MAJOR CONTRIBUTIONS

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Historical Development

The Visakhapatnam Regional Centre of CMFRI had its beginning in 1947 as a survey unit. This unit was housed in the premises of the Department of Fisheries, Government of Andhra Pradesh. The main function of the survey unit was to collect the fish landing data. The survey unit was upgraded as a research unit and research activities were initiated in the year 1955 in the premises of Department of Zoology, Andhra University. Later, the Calcutta research unit of CMFRI was closed and merged with the Waltair research unit of CMFRI in 1962. The research unit was shifted to a new premise within the Andhra University campus and remained there till September 1994. During 1970 the research unit of CMFRI was renamed as a sub station and subsequently as research centre in 1976.

Due to shortage of laboratory space, 20 cents land was taken on lease from the Visakhapatnam Port Trust in Fishing Harbour area and the presently existing building was constructed during 1984 by CMFRI and has been functioning as a Shore Laboratory facility. The present

building having a plinth area of 512 m² for CMFRI and 571 m² for CIFT with a common area of 173 m² totaling to 1256 m² stands in a two acre land allotted in 1981 by the Andhra University on long lease. The late Shri. G.S. Dhillon, Honourable Union Minister for Agriculture laid the foundation stone for the building on 20 July 1987. Later the Kakinada Research Centre of Central Institute of Fisheries Technology was shifted to Visakhapatnam and housed in the same building. Dr. Balaram Jakhar, Honourable Union Minister for Agriculture, inaugurated the building on 17 September 1995.

Apart from the main building mentioned above two mariculture laboratories were constructed in the year 2000. Towards the residential facility of the Visakhapatnam Research Centre of CMFRI and CIFT, 25 residential quarters (Type I to IV) were constructed during 1997 – 2000 in the 3.5 acre land purchased by the CMFRI from the Visakhapatnam Urban Development Authority in June 1980.

A list of the Officers-in-Charge of the research establishment of CMFRI are given below:

1. Dr. L. B. Pradhan	1955-1958
2. Dr. R. V. Nair	1958-1961
3. Dr. B. Krishnamoorthi	1961-1962
4. Shri. V. Sadasivan	1962-1965
5. Dr. K. V. Sekharan	1965-1970
6. Dr. B. Krishnamoorthi	1970-1981
7. Dr. K. Radhakrishna	1981-1989
8. Dr. G. Luther	1989-1994
9. Dr. V. S. K. Chennubhotla	1995-2000
10. Dr. G. Syda Rao	2000-

Major contributions

Crustacean resources

Studies have been conducted on the various aspects of the prawn fisheries of the north east coast of India. Data were collected on all the five types of fishing operations viz. artisanal boats, small mechanized boats, *sona* boats, mini trawlers and large trawlers and estimates of the biological parameters of all the commercially important penaeid prawns were calculated. Based on these investigations, suggestions were given to the industry to follow proper harvesting methods so that the fisheries can be conducted in a sustainable manner. For example, as early as 1987, it was advised not to introduce any more large trawlers, as it would not be economically viable to operate these trawlers in view of the increasing number of *sona* boats and their cost efficiency over the large trawlers. A bio-economic analysis conducted in 1993 with the cooperation of the FAO experts established that effort should be reduced by 40% in all the five fleets to make all

the units economically viable. Unfortunately, none of the suggestions were taken in proper spirit either by the State government or by the industry leading to the present crisis in the fishing industry particularly with reference to penaeid prawns.

Demersal resources

Biology and stock assessment of the following demersal resources, which have been studied in detail, merits special mention.

Sciaenids

Biology of *Pseudosciaena aneus*, *P. bleekeri* and *Johnius carutta* were studied. Food and feeding, spawning habits and age and growth were studied. All species spawn once a year and the spawning periods varied for each species; *P. aneus* from December to March, *P. bleekeri* from Feb to May and *J. carutta* from January to April. Both *P. aneus* and *P. bleekeri* have single batch of mature egg where as *J. carutta* has two batches. The food and feeding habits of *Pennahea macrophthalmus* was studied. *P. macrophthalmus* is a macrophagous carnivore feeding on teleosts and prawns and becomes more ichthyophagous with age. There was a gradual decrease of all species of sciaenid population. The rate of exploitation of *J. carutta* appeared to be on the higher side showing a decline in yield, which calls for a reduction of effort by about 30%.

Catfish

Stock assessment studies on *Tachysurus tenuispinis* from Visakhapatnam indicated that the high fishing mortality was due to increased fishing pressure by bottom set gillnets and trawlers in

seventies. It is found that Y/R attained maximum at a fishing mortality rate of 0.3 when the actual fishing mortality rates varies within 0.58 and 0.96. This indicated that any further attempt to increase production from the stock by increasing the fishing pressure would be detrimental to resource. The two species *T. thalassinus* and *T. tenuispinis* were under heavy fishing pressure. It was suggested that either the fishing pressure should be reduced or the size at first capture be increased considerably to achieve the MSY from the available stock in order to regulate the fishery. It was also suggested to intensify the use of hooks and lines all along the range of availability of catfish irrespective of area or season. The above prediction has come true and the fishery for catfish that dominated in all gears from mid eighties onwards has presently become only nominal along north east coast. Catfish is not a target species for all the major gears in which they are usually caught. Any suggestions to decrease the fishing effort of those gears may not be a practicable proposition in the light of the fact that all such gears are meant to exploit a large array of demersal and column fishes.

Biology and management of other demersal resources such as nemipterids (*Nemipterus japonicus* and *N. mesoprion*), lizard fishes (*Saurida tumbil* and *S. undosquamis*), were also studied. Morphometric and meristic characters of *S. tumbil* was studied to differentiate the populations in Indian waters. It was found that there are three distinct populations confined to Visakhapatnam-Kakinada region, Bombay-Mangalore region and Tuticorin.

Pelagic fisheries division

The pelagic resources studied are sardines, mackerel, whitebaits, ribbonfishes, seerfishes and tunas. Monitoring the catch and effort in different gears and the biology of different species has been recorded. The increase in exploitation of oil sardine along the east coast in late eighties, reaching a peak in 1999 where it surpassed the production along west coast and finally the decline have been documented. The lesser sardine fishery along the Andhra-Orissa region has reached the maximum limit and no further increase in effort is recommended. Studies on exploitation of mackerel indicated that capture of undersized and uneconomical groups caused reduction in the commercial size groups.

Whitebaits have experienced only moderate fishing mortality and there is a possibility of increasing production by increasing fishing effort. Exploitation rate of ribbonfishes increased during the 80's and 90's when compared to late 60's and 70's largely being fished by the industrial trawlers. Seerfishes were over exploited and fishing by shore seines, trawl nets and small meshed gill nets, and driftnets need to be discouraged.

On shore pearl culture

The technology of onshore pearl culture has been developed at this research centre. This technology is apt to the prevailing rough sea conditions along the coasts of peninsular India. In this method the pearl oysters are grown in cement tanks constructed close to the sea. The oysters are fed with a mixed diet of phytoplankton species. The oyster growth is fast and reaches implantation size in about 6 to 8 months from spat. The

survival rate is high and is normally above 80%. The pearl oysters are implanted with 3-6 mm nuclear beads and will take about 6-8 months for pearl production. Technology of captive maturation and brood stock management was also developed and streamlined in order to have ready-to-spawn brooders round the year for hatchery operations. The entire operation is pollution free and ecofriendly as no antibiotics or chemicals are used at any stage.

Domestication of tiger shrimp, *Penaeus monodon*

Shrimp culture industry is facing setback since 1995 due to white spot virus. Of late, all the commercial hatcheries are depending on wild gravid females due to failure of brood stock management system in captivity. Inconsistent availability of gravid females from wild is the main reason for inadequate production of seed at appropriate time. Hence domestication of tiger shrimp is indispensable to produce Specific Pathogen Free brood stock in captivity. The Central Marine Fisheries Research Institute has taken up domestication programme. Success was achieved in inducing captive maturation and brood stock management. Research from the F_2 generation is being continued at this Centre. In March 2001, F_3 generation seed was produced without using chemicals and antibiotics. They are growing well in the laboratory. This domestication

programme has to be continued until the production of F_6 generation for commercialisation. The work is progressing well.

Future Plans, Issues and Concerns

With the upgradation of the Visakhapatnam Research Centre of CMFRI into Regional Centre, the establishment has to be further strengthened with more scientists from different disciplines to carry out research on the current problems and issues of the region like shrimp brood stock development, induced breeding and seed production of cultivable finfishes, evolving of high quality strains of finfishes and shell fishes for farming, diagnosis of diseases in cultured organisms and development of vaccine. Selection experiments with emphasis on marker assisted selection in cultivable species is one of the priority area of research which needs to be addressed. Research in tuna fisheries need more attention in view of the importance of demand in the export trade. Delineation of the exploited stocks has to be attempted, using DNA markers for improved management practices. Investigations on relationships between the environmental factors and catches of different species and groups of the region will be further intensified. The Regional Centre will play an active role in demonstrating viable technologies with expanded extension programmes.

