

# CIFE

## annual report

2007-08



### CENTRAL INSTITUTE OF FISHERIES EDUCATION

Deemed University  
Indian Council of Agricultural Research  
Seven Bungalows, Versova  
MUMBAI-400 061





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# 1. Preface



The year 2007-08 has witnessed a great success in the academic front by bagging all the 15 seats in aquaculture and 2 seats in animal biotechnology by the students of CIFE. This has been possible through the combined efforts of students and faculty. Intensive coaching by innovative method followed by mock tests and interviews arranged in the Campus enhanced the confidence level of the students which has been reflected in their final selection.

A week long training exposure on board *MFV Saraswati* and hands-on-training at farms during field training has helped the students to learn and understand the subject in a better manner. Hands-on-training programmes conducted at CIFE Headquarter and its Centres besides training and result demonstration programmes conducted in North Eastern States have been to the great satisfaction of the participants, while providing major impetus for Aquacultural development in the region.

The on going research programmes have shown satisfactory results. One of the major outcome has been the synthesis document of Policy Framework for Fisheries and Aquaculture Development which will form the basis for State Fisheries Departments to formulate their State specific enabling fisheries & aquaculture policy.

CIFE's varied achievements in academic, research & development spheres during 2007-08 have been reflected in different chapters of this Annual Report. The contribution made by all the faculty members, staff and students are highly appreciated.

I express my sincere gratitude to the Director General (ICAR), Deputy Director General (Fisheries) and Deputy Director General (Education) for their kind support and guidance. I acknowledge with thanks Members of Board of Management, Chairman and Members of Research Advisory Committee, Members of Academic Council, Extension Council, Head of Divisions, Board of Examiners and other Institute - level committees for their co-operation and support. I am grateful to the Directors and Scientists of all the Fisheries Institutes, Guest Faculty and External Examiners for their time to time support. I thank all the scientists, staff and students of CIFE for their contributions. I record my appreciation to the publication team for bringing out this annual report.

(DILIP KUMAR)  
Director

CIFE, Mumbai  
March, 2009



## 2. Executive Summary

In the year 2007-08 CIFE observed overall good progress. During the year 20 institutional research projects, 23 externally funded projects, two international research projects and two contract research project were continued as planned and there has been very good progress. Survival of tiger shrimp (*Penaeus monodon*) using inland saline water in Haryana has encouraged further to carry out production experiments with techno-economic feasibility. The soil quality of salt affected ponds in Haryana showed very poor levels of nitrogen and phosphorus. Isolation of indigenous bacterial strains for using as biofertilizers to improve the fertility was carried out. The salt affected inland areas of Maharashtra showed excess sulphates which needs to be removed and necessary manipulation of ionic concentrations for optimum ratio and nutrient availability. Under the project strategies for the control of Nodavirus infection in *Macrobrachium resennergii* full length sequence information of Indian isolate of MrNV, 8 pairs of new primers have been designed. From the study on interaction of wild stock of *M. resennergii* and dietary protein level, it was observed that high protein fed group exhibited higher hemolymph glucose but stock type did not exhibit any variation in the glucose content in hemolymph. Higher respiratory burst activity (NBT) was recorded in the higher protein fed groups. Plantation of green manure crop Dhencha in Dimbhe reservoir, Maharashtra resulted in increase in the productivity of the reservoir.

Under the project on policy framework for Indian fisheries and aquaculture five zonal level consultative workshops on fisheries and aquaculture policy were conducted successfully at Guwahati, Hyderabad, Goa, Chandigarh and Patna. The proceedings of the workshops and a synthesized document has been prepared and sent to different stakeholders, the policy makers and development planners. In an empirical study of patents and patenting activity in the fisheries sector a total of 151 patents in fisheries sector have been documented and further classification as per specializations was carried out. Institute developed different ready to eat fish products like sandwich paste, fish curry in retortable pouch and different recipes.

In the ongoing educational programmes 16 students obtained Ph. D. Degree, 36 students their M. F. Sc. Degrees and 22 their Post-Graduate Diploma in Inland Fisheries. Total 92 students were admitted in the new academic session out of which 25 students for Ph.D. 45 students for M.F. Sc. and 22 students for P. G. Diploma in Inland Fisheries.

The extension activities progressed well during the period. Institute organized 59 short term training programmes at its Headquarter and four

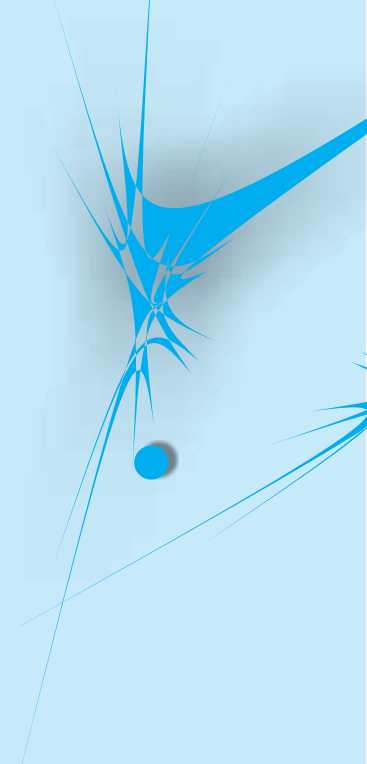
centres and a total of 1284 number of participants were trained. CIFE exhibited its activities and achievements in 22 exhibitions organized all over the country. Four radio talks were delivered by the staff on various topics. The activities of the institute were given wide coverage on television and print media. Technical guidance was provided to the farmers by the scientists of the institute at various platforms. Fish Farmers' Day was celebrated in CIFE headquarters and at the Centres. 1343 students from various schools, colleges, institutions and universities visited CIFE and its Centres and were demonstrated various ongoing activities. Under transfer of technology and demonstration programmes, innovative aquaculture extension strategy and approaches were demonstrated in North-Eastern States (Tripura, Manipur, Mizoram, Assam and Nagaland). Besides this, scientists from its centres demonstrated the technologies and provided technical know-how during the reporting period. Institute organized 35 numbers of training programmes in North Eastern States. Dimbhe Reservoir Fishertalk Meet for fisherwomen was organized on the importance of fisheries in the livelihood development of Katkari Tribals. Two research and training Vessels *MFV Saraswati* and *MFV Narmada* conducted 20 cruises for the students and trainees.

During this year Dr. S. C. Mukherjee, Joint Director, received the Rajiv Gandhi Sadbhavana Award bestowed by Rajiv Gandhi Foundation. Dr. B. K. Mahapatra, Senior Scientist, was awarded fellowship of Zoological Society and fellowship of Inland Fisheries Society of India. Dr. Parimal Sardar, Scientist (SS), bagged the best research paper presentations award of Animal Nutrition Society of India, Dr. S. D. Singh, Principal Scientist, was awarded international Membership of American Fisheries Society and received C. R. Sullivan International Endowment Fund Fellowship from IFS/AFS, USA. Dr. Singh also received INSA and DBT International Travel Fellowship from Govt. of India for his visit to USA. Dr. K. K Jain, Principal Scientist and Dr. (Mrs) Latha Shenoy, Senior Scientist, were awarded the fellowships of the Academy of Science, Engineering and Technology, Bhopal. Dr. A. K. Pal, Principal Scientist, was elected Fellow of the National Academy of Agricultural Sciences (NAAS), New Delhi. Dr. S. Jadhao, Scientist, was elected as an Associate of National Academy of Agricultural Sciences (NAAS), New Delhi.

A total of 52 research papers were published in refereed journals. 16 popular articles, 84 abstracts, 8 books chapters, 4 training manuals and 7 books/ technical bulletins/ brochures were published during the reporting period.

The faculty participated in 60 workshops/seminars/conferences/congresses. Faculty attended 17 training programmes/winter schools/summer schools/brainstorming sessions. Institute organized 17 meetings on different programmes, 9 workshops and 3 CAS programmes.

The meetings of RAC, Board of Management, Academic Council and Extension Council were held as per schedule.







***MFV Saraswati***

### 3. Introduction



The Central Institute of Fisheries Education (CIFE) was established on 6 June 1961 under Government of India with the assistance of FAO/UNDP to impart professional training and education to the in-service personnel of the expanding fisheries development sector at that juncture. Later, on 1 April 1979, the institute came under the umbrella of Indian Council of Agricultural Research.

The Deemed University status was accorded to CIFE on 29 March 1989. Subsequently, the scope and mandate have been widened to include education as well as research. At present, CIFE offers Master programmes in nine and Doctoral programmes in eight disciplines.

The infrastructure facilities of CIFE have been upgraded over the period to achieve the international competitiveness. Initially, CIFE was housed in the Institute of Science building, Bombay, and in 1964, it was shifted to a rented building at Masjid Bunder, Bombay. However, in March 1967, the Institute moved to campus at the Seven Bungalows, Versova, in the western suburb of Bombay. In 2003, CIFE developed its new campus at Yari Road. CIFE headquarter is presently housed in the Seven Bungalows campus, and the newly developed Yari Road Campus, Versova, each a kilometer apart. The 2.3 ha Seven Bungalows campus has a three-storey building that houses laboratories, classroom, computer cell, committee room, auditorium, Director's chamber, library, aquarium, museum, workshop, and administrative and accounts sections together with a backyard wet-lab and prawn hatchery. The campus also has hostel and dormitory facilities, guest house, staff quarters, gymnasium, healthcare centre and sports facilities. The recently-developed 6.7 ha Yari Road Campus has (three floors with basement) academic building that houses state of the art laboratories, classrooms, faculty and staff chambers, chambers of the Director and Joint Director, conference hall, community hall, aquarium, examination and academic cells. Additional facilities such as wet labs, ponds and hatcheries, library, staff quarters and ladies hostel, etc were also developed in the Yari Road Campus. CIFE also possesses two training-cum-research vessels, *MFV Saraswati* and *MFV Narmada*.



## Budget (Rs. in Lakhs)

S.No.	Head	Sanctioned	Received	Expenditure Incurred
1	Plan + NEH	850.00	850.00	607.33
2	Non-plan	1322.00	1213.00	1307.15
3	CAS	13.96	13.96	13.96
4	SDU	126.82	126.82	93.48
5	Externally funded projects	111.44	111.44	95.36

There are eight major functional divisions at CIFE equipped with state of the art laboratories and various sections/cells to carry out specific work. Apart from the headquarters in Mumbai, the Institute has four centres located in different aqua-climatic regions (Kolkata in West Bengal, Kakinada in Andhra Pradesh, Powarkheda near Bhopal in Madhya Pradesh and Rohtak in Haryana) of the country with farms and infrastructural facilities to impart hands-on training to students, farmers and development personnel as well as to conduct need-based research projects.

### Mandate:

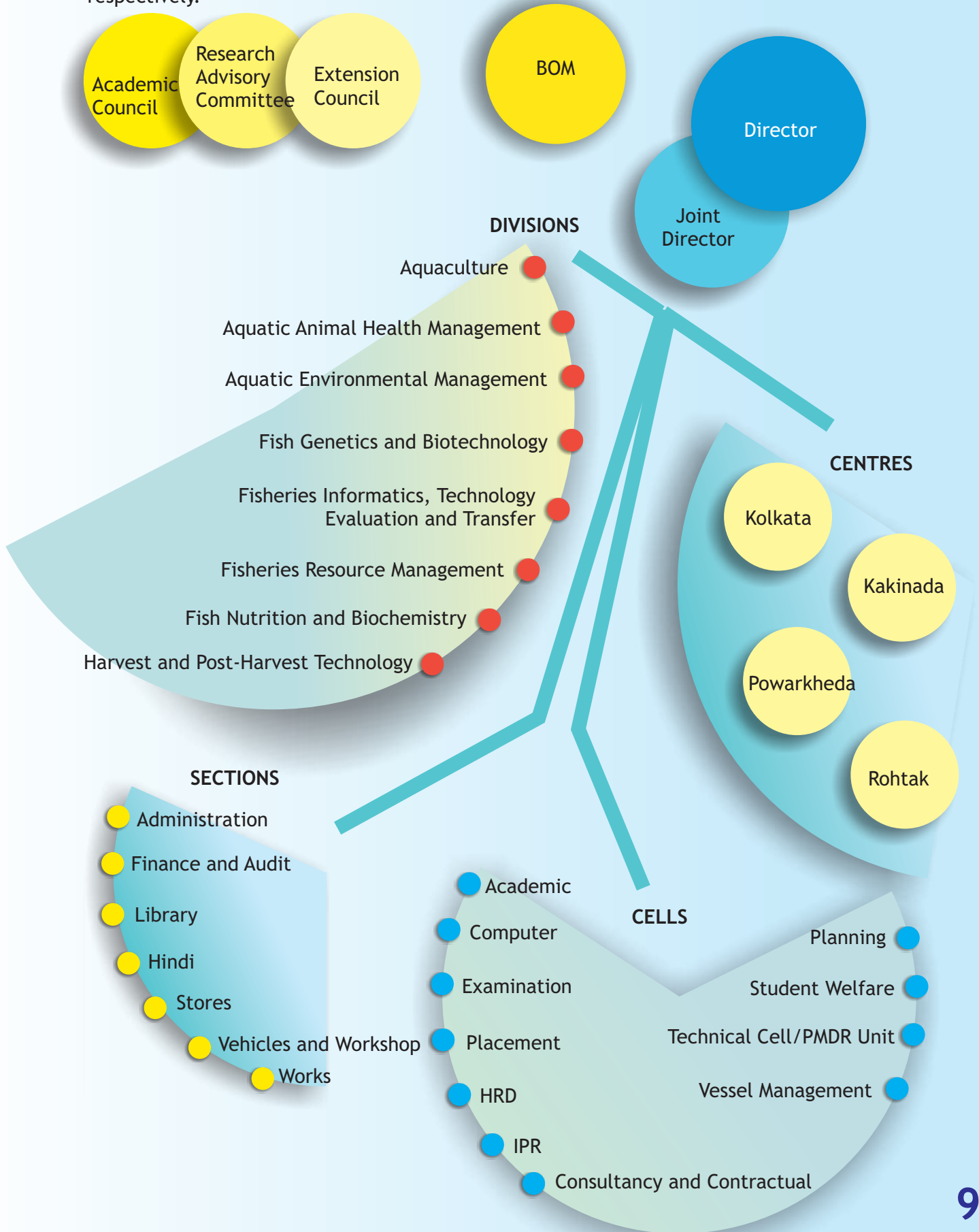
The mandate of CIFE was revised from time to time to keep in pace with the changing needs of the country. The present mandate of CIFE is

- i. To conduct post-graduate academic programs in core and emerging disciplines of fisheries science
- ii. To conduct basic and strategic research in frontier areas of fisheries
- iii. To conduct demand-driven training and educational programs for different stakeholders in fisheries sector
- iv. To provide technical support, inputs for policy development, and consultancy services



## Organization and Management

At the helm of affairs of overall Institutional Management, CIFE has a Board of Management which also functions as the highest decision making body at the Institute level. The decisions and recommendations pertaining to academic, research and extension activities of the Institute are made by Academic Council, Research Advisory Committee and Extension Council, respectively.





## 4. Educational Achievements

### 4.1 Results

S. No.	Name of the programmes	No. of successful Students
1	Ph.D.	16
2.	Inland Aquaculture	4
3	Fisheries Resources Management	5
4	Mariculture	3
5	Post - Harvest Technology	5
6	Freshwater Aquaculture	4
7	Fish Genetics & Biotechnology	4
8	Fish Pathology & Microbiology	2
9	Fish Nutrition & Biochemistry	5
10	Fish Business Management	4
11	P.G. Diploma in Inland Fisheries	22
	<b>Total</b>	<b>74</b>

The following are the Ph.D theses and M.F.Sc dissertations on which degrees were awarded during the year 2007-08:

## 4.2 Ph.D. Theses

Name of the Student	Thesis title	Name of the Guide
Ramalinga MC-133 (2000-03 batch)	Environmental impact assessment of suspended oyster <i>Crassostrea madrasensis</i> (Preston) culture	Dr. V. Kripa
Jyotiranjana Nayak PHT-139 (2001-04 batch)	Effect of n-3 polyunsaturated fatty acids from fish on Daltons's lymphoma ascite and liver cancer in mice	Dr. P. G. Viswanathan Nair
K. Rekha Devi PHT-142 (2001-04 batch)	Biotechnological studies on <i>Vibrio parahaemolyticus</i>	Dr. P. K. Surendran
P. Yesudhasan PHT-143 (2001-04 batch)	Effect of modified atmosphere packaging on the shelf life of commercial important fish	Dr. T. K. Srinivasa Gopal
Sushant Kumar Patra MC-148 (2001-04 batch)	Histomorphological characterization of immune system in Greasy Grouper, <i>Epinephelus tauvina</i> (Forsskal, 1775)	Dr. K. C. George
A. Chandrasekhar Rao MC-149 (2001-04 batch)	Some studies on reproductive physiology of the female Grouper, <i>Epinephelus diacanthus</i> (Valenciennes)	Dr. L. Krishnan
S. K. Kunda IAC-155 (2001-04 batch)	Prevention of antibiotic residues in farmed shrimps: A study of development of HACCP framework applicable at shrimp farms in India	Dr. K. Venkateshvaran
Haribabu Punati IAC-158 (2001-04 batch)	Aquaculture of <i>Macrobrachium rosenbergii</i> (de Man, 1879) in Andhra Pradesh: A stress related pathological study	Dr. S. C. Mukherjee
Prashant Telvekar FRM-163 (2002-05 batch)	A study on biology and stock assessment of <i>Johnnieops sina</i> (Cuvier, 1830) from Mumbai waters	Dr. R. S. Biradar
Krishna Sukumaran IAC-170 (2002-05 batch)	Requirement, deficiency and hemato-biochemical response to dietary phosphorus in <i>Catla catla</i> fingerlings	Dr. A. K. Pal
Shahnawaz Ali FRM-181 (2003-06 batch)	Quantitative biodiversity of crustaceans and molluscs of selected intertidal shores of Mumbai	Dr. S. K. Chakraborty
Dipesh Debnath FNB-195 (2003-06 batch)	Growth, digestive and metabolic responses of <i>Labeo rohita</i> fingerling to different dietary protein levels	Dr. A. K. Pal
Sabeena Farvin PHT-197 (2003-06 batch)	Biochemical studies on the protective effect of squalene on experimentally induced myocardial infarction in rats	Dr. R. Anandan
Dhananjay Kumar Varma IAC-210 (2004-07 batch)	Study on functional efficacy of testis and cryogenic preservation of male gametes of Mrigal, <i>Cirrhinus mrigala</i> (Ham.)	Dr. P. Routray
Hikkaduwa M. P. Kithsiri IAC-211 (2004-07 batch)	Growth and reproductive performance of female guppy, ( <i>Poecilia reticulata</i> ) in response to dietary fatty acids	Dr. G. Venkateshwarlu
Nitai Saha IAC-212 (2004-07 batch)	Pigmentation and breeding performance of swordtail, <i>Xiphophorus helleri</i> (Heckel 1848) by using natural colour additives and essential fatty acids in artificial feed	Dr. (Ms) A. Sinha



### 4.3 M.F.Sc. Dissertations

Name of the student	Title	Guide
Mr. Bopanna, A. G. FRM-195	Characterization of methane oxidizing bacteria in mangrove rhizosphere	Dr. A. Vennila
Mr. Pawan Kumar FRM-196	A study on otolith morphology and morphometry of various representation of family Sciaenidae from Mumbai waters	Dr. S. K. Chakraborty
Ms. Sajina, A. M. FRM-197	Stock structure analysis of Indian Mackerel along the West coast of India using morphological tools	Dr. S. K. Chakraborty
Ms. Soma Das FRM-198	Grazing benthic community in the intertidal area along Mumbai coast	Dr. G. Deshmukhe
Mr. Thimmaiah, G. N. FRM-199	Appraisal of Bhadra reservoir fisheries using GIS	Dr. R.S . Biradar
Ms. Kouberi Nath IAC-175	Toxicity of nitrite on Angel Fish and its possible remedy	Dr. M. P. S. Kohli
Mr. Santosh Kumar IAC-176	Effect of temperature on sex ratio and survival of <i>Poecilia reticulata</i> (Peters, 1860)	Dr. Neelam Saharan
Mr. S. S. Prasad IAC-177	Comparative study of growth and survival of swordtail ( <i>Xiphophorus hellari</i> ) fed with live feed ( <i>Moina</i> sp.) and artificial feed	Dr. V. K. Tiwari
Ms. T. P. Prabita IAC-178	Evaluation of HUFA, Vitamins C & E enriched moina for post larvae of <i>M. rosenbergii</i> (de Man, 1879)	Dr. A. K. Reddy
Mr. G. Venkata Ravi MC-95	Development in <i>in vitro</i> primary cell culture systems from the rabbit fish <i>Siganus canaliculatus</i> (Park, 1797)	Dr. K. S. Sobhana
Ms. P. K. Jeeja MC-96	Nutritional profile of rotifer ( <i>Brachionus plicatilis</i> ) cultured using selected natural diets	Dr. I. Joseph
Ms. Madonna T. Thachil PHT-37	Tocopherol and PUFA in young and aged rats	Dr. S. Mathew
Ms. L. Manjusha PHT-38	Studies on bacteriological methods for the detection of antibacterial residues in fish and fishery products	Dr. S. Sanjeev
Mr. Pankaj Kishore PHT-39	Prevalence of <i>Yersinia</i> spp. in seafood and their characterization	Dr. K. V. Lalitha
Ms. M. A. Rajeena PHT-40	Effect of natural antioxidants on the quality and storage stability of freeze-dried coated fish balls	Dr. A. C. Joseph
Mr. K. Shashidhar PHT-41	Studies on ready-to-serve calcium and iron fortified shrimp soup in retortable pouches	Dr. C. N. Ravishankar
Mr. P. Himanshu FGB-22	Development of stable heavy metal biosensors by integration of biosensor genetic elements into <i>E. coli</i> chromosome	Dr. A. Chaudhari

<b>Mr. Renuka Murthy</b> FGB-23	Characterization of <i>Perna viridis</i> metallothionein promoter for use in transgenic fish biosensors responsive to heavy metals	<b>Dr. A. Chaudhari</b>
<b>Mr. Santosh Kumar</b> FGB-24	Genetic studies on growth traits of <i>P. monodon</i> (Fabricius)	<b>Dr. S. Jahageerdar</b>
<b>Mr. Shibashis Das</b> FGB-25	Comparative study of growth of different stocks of <i>M. rosenbergii</i> (de Man 1879) and their molecular genetic identification	<b>Dr. Gopal Krishna</b>
<b>Mr. Kundan Kumar</b> FPM-22	Clinicopathological and histomorphological studies on induced inflammatory conditions in <i>L. rohita</i> (Ham)	<b>Dr. S. C. Mukherjee</b>
<b>Mr. B. Manas Ranjan</b> FPM-23	Comparative study on serum immunoglobulin of Indian major carps.	<b>Dr. M. Makesh</b>
<b>Mr. Muthappa, N. A.</b> FNB-21	Methyl donors supplementation for improved growth and stress mitigation in <i>L. rohita</i>	<b>Dr. S. B. Jadhao</b>
<b>Mr. Rajesh Kumar</b> FNB-22	Study on cDNA synthesis encoding $\Delta^6$ fatty acid desaturase gene of <i>C. mrigala</i> using RT-PCR	<b>Dr. S. D. Singh</b>
<b>Mr. Rathod Ramesh</b> FNB-23	Fatty acid profiles of some important pelagic and demersal fishes off Mumbai coast with reference to their nutritive value	<b>Dr. G. Venkateshwarlu</b>
<b>Mr. C. S. Tejpal</b> FNB-24	Evaluation of dietary L-tryptophan for mitigating crowding stress in <i>C. mrigala</i> fingerlings	<b>Dr. A. K. Pal</b>
<b>Mr. Vidya Sagar</b> FNB-25	Nutro-physiological responses of three wild stock <i>M. rosenbergii</i> juveniles under different nutritional milieu	<b>Dr. K. K. Jain</b>
<b>Mr. V. Vishal Ghotane</b> FMB-16	Market research on value chain in fisheries sector in the states of Maharashtra and Gujarat	<b>Dr. P. S. Ananthan</b>
<b>Mr. Jitendra Kr. Jena</b> FMB-17	Market research for value added fish and fish products in selected North-Eastern states of India	<b>Dr. S. N. Ojha</b>
<b>Mr. Rama Chandra Rout</b> FBM-18	Market research for value-added fish and fish products in Eastern India	<b>Dr. R. S. Biradar</b>
<b>Mr. S. Pravin</b> FBM-19	Market research for value-added fish and fish products in Southern States of India	<b>Dr. S. S. Salim</b>
<b>Mr. Sunil Sabat</b> FBM-20	Market research for value added fish and fish products in selected Northern states of India	<b>Dr. A. Sharma</b>

## 4.4 Enrollments

S. No	Name of the Programme	Number of students Admitted
1	Ph.D. (Fisheries Resource Management)	5
2	Ph.D. (Aquaculture)	9
3	Ph.D. (Post-Harvest technology)	3
4	Ph.D. (Fish Biotechnology)	2
5	Ph.D. (Fish Genetics)	2
6	Ph.D. (Fish Pathology & Microbiology)	2
7	Ph.D. (Fish Nutrition & Biochemistry)	2
8	Ph.D. (Fish Business Management)	Nil
9	M.F.Sc. (Fisheries Resource management)	5
10	M.F.Sc. (Fish Genetics & Biotechnology)	5
11	M.F.Sc. (Fish Nutrition & Biochemistry)	5
12	M.F.Sc. (Fish Business Management)	4
13	M.F.Sc.(Fish Pathology & Microbiology)	5
14	M.F.Sc. (Post-Harvest Technology)	5
15	M.F.Sc. (Aquaculture)	9
16	M.F.Sc. (Fisheries Extension)	4
17	M.F.Sc. (Aquatic Environmental Management)	3
18	P.G. Diploma in Inland Fisheries	22
	Total	92



**CIFEANS CREATE HISTORY - CAPTURE ALL SEATS IN ARS EXAMINATION - 2007**



## 5. Research Achievements

### THRUST AREA 1: UTILIZATION OF SALT - AFFECTED INLAND AREAS THROUGH AQUACULTURE

**Project Title: Refinement of existing and development of new technologies for inland-saline aquaculture**

**Personnel :** C. S. Purushothaman, P. P. Joshi, S. Raizada, U. K. Maheshwari, N. K. Chadha, G. Deshmukhe, A. K. Verma and G. Venugopal

#### **Achievements**

It has been observed in the past years that tiger shrimp (*Penaeus monodon*) post-larvae do not survive in moderate to high salinity inland ground saline water at the Rohtak Centre of CIFE. Hence, a short experiment was carried out to evaluate the role of potassium in inland ground saline water. For the experiment, 10,000 post-larvae (PL-15) of *P. monodon* were procured from Chennai on 19-20 September 2007 and stocked in nine FRP tanks (500 l) at 1000 PL/tank in two treatments of 10% salinity inland ground saline water amended with potassium levels equivalent to 50% (T-1) and 100% (T-2) of coastal seawater along with control of raw ground saline water in triplicates. Heavy mortality of around 50% was noticed in control within six hours of stocking and total mortality occurred in 48 hours in two tanks. One tank under the control set was subsequently amended after six hours with potassium level equivalent to coastal seawater which showed the revival of the leftover moribund post-larvae and the mortality was totally stopped. However, there was only 10% mortality in T-1 and T-2 after 10 days of rearing. The study, thus, showed that potassium amendment is essential for the survival of tiger shrimp PL at 10% salinity in inland ground saline water. The study reveals that intensive experiments are required to study the effect of various ions and their ratios in inland ground saline water for the survival of tiger shrimp. Seaweed (*Ulva sp.*) was attempted to be cultured in raw inland saline water of up to 10% in one experiment. No growth was observed and all the stock died within one week of the start of the culture. In the subsequent experiment, where raw water of 10-15% salinity was used, very poor growth was observed and the seaweed died between 7 and 10 days. In another experiment, the salinity of raw water was raised from 15 to 20% by dissolving common salt. Water of 20% fortified with potassium to maintain the level as in open sea water was used for the next experiment and Agrimin was used as a source of nutrients. Another experiment was conducted with raw ground saline water the salinity of which was raised to 25‰ by dissolving common salt. The stocking was also done on 15 March 2008 and the culture operation was for 45 days. Ground saline water with the salinity raised from 20 to 25‰ by adding common salt and fortified with potassium and Agrimin was used in the next experiment for the same duration. The last experiment gave the best results indicating the necessity of potassium amendment and additional nutrient supply.

## **Project Title: Nutrient management and seepage control in salt-affected areas for aquaculture**

**Personnel:** A. Vennila, N. Saharan, S. Raizada, V. K. Tiwari, P. K. Pandey, A. K. Verma, A. K. Reddy and Chandraprakash

### **Achievements**

The soil quality of ten nursery ponds (NP) of CIFE Rohtak Centre (Haryana) and eight rearing ponds (BP) of the Banyani Fish Farm (high saline) was analyzed. The soil texture of 13 ponds was found as loam, four as silt-loam and one as clay-loam. Based on the physicochemical characteristics of the pond soils, 14 ponds were categorized as saline-sodic and four as normal. Only five out of 18 ponds have high organic carbon, and the minimum and maximum values for organic carbon were found to be 0.265 and 0.948%, respectively. All the ponds showed very poor levels of nitrogen and phosphorus. However, the level of available potassium was found to be moderate to high. Therefore, proper nutrient management practices need to be developed for these soils. As an attempt to increase the fertility of the soil through biofertilizers, phosphatase activity of 25 isolates of Haryana saline water and soil samples in duplicates were evaluated as mg p-nitrophenol released/g CDW after 72 hours of incubation. The analysis of variance showed significant difference. The five isolates having high phosphatase activity (HWPP4, HWPP5, HPP23, HPP19 and HWPP8) were selected for further growth and stability studies on the carrier materials. The seepage management experiment on the composited soil samples from Lahli and Banyani was conducted in sand-tank models. The organic materials (coarsely powdered cow-dung and sugarcane bagasse) were selected for the study. The seepage measurement was carried out by constant head permeater method for disturbed samples. The seepage rate of Banyani soil was found to be very low when compared to the Lahli samples in control. This might be due to the higher clay content and water retention capacity of Banyani soil than Lahli soil. The high carbonate and bicarbonate contents of Banyani soil is also responsible for the dispersion of clay and clogging of pores. The incorporation of organic material as a layer significantly reduced the seepage in both Banyani and Lahli soils. Among the organic materials, cow-dung treatment was found to have significantly lower seepage in Lahli soils than sugarcane bagasse, whereas the opposite was true for the Banyani soils. The salt-affected inland areas of Maharashtra were surveyed and the samples were collected in two slots: one in the month of October 2007 which covered Shere village and Malkhed village in Satara district; Digraj village and Kattafrem village in Sangli district; and Majanawadi village in Kolhapur district. The second collection covered Digraj (mainly aquaculture pond in MPKV Research Farm), Phaltan and Karad in January 2008. The salinity of the

water samples ranged from 0.5 to 5.5‰. The highest salinity was observed in the water sample taken from the subsurface drain at Digraj. The pH was in neutral range. Phosphorus was found to be below detectable range in all the samples. The hardness and chloride content were high except the field drainage near the canal and in the canal water of Shere village. The soil pH was in the neutral range, whereas the electrical conductivity (EC) was > 4 dS/m except for five samples. The texture was clayey with few samples falling under the category clay-loam and black soils, and hence, the low seepage. The water retention capacity was high. The salinity was high in all the water samples of the aquaculture area and subsurface drainage system of Digraj. The sulphate content was higher than the chloride content in all the samples except pond water. Similarly, the sulphate content of pond soil was also very high. The EC was very high in Digraj and Karad samples except Phaltan sample. Organic carbon content except Karad and total nitrogen except Phaltan were also very high. Therefore, in these soils, attempt should be made to address the issues of removal of excess sulphates/manipulation of ionic concentrations to maintain optimum ratio and optimization of nutrient availability.

**Project Title: Strategies for the control of Nodavirus infection in *Macrobrachium rosenbergii***

**Personnel:** K. V. Rajendran , A. Chaudhari, M. Makesh

**Achievements**

Large-scale mortality of *M. rosenbergii* was reported from Kakinada, Andhra Pradesh. Moribund samples were collected and transported to the laboratory, (alcohol- preserved as well as frozen). Representative samples were subjected to RNA extraction, cDNA preparation and subsequent PCR. Apart from the primers which we have already used to detect the viruses, new sets of primers were employed in the detection of MrNV and XSV. In the case of MrNV, a primer set (MrNV-F1 and MrNV-R1) targeted to amplify a 1.14 kb region of RNA2 segment of the virus was used. However, a primer set (XSV-F1 and XSV-R1) which could amplify 772 bp regions was used in the case of XSV. Successful amplification was noticed in both MrNV and XSV.

Three PCR products (590 bp and 681 bp MrNV-specific and 500bp XSV-specific) were purified from Agarose gel, cloned in pTZ57R/T vector and transformed into *E. coli* DH5 cells and the purified plasmids were submitted for sequencing, in the last quarter. Sequence data were analysed and found that 98% homology existed between the Indian isolate of MrNV studied and the gene sequences already reported in the GeneBank, with respect to the 590 bp fragment of the RNA1 segment. Similarly, 97% similarity was observed in 681 bp fragment amplified and sequenced. With respect to XSV in the 500 bp region, 98%

homology was observed, when compared with the reported XSV sequence available in the GeneBank.

Two experimental trials were conducted to induce the white tail disease under laboratory conditions. In the first experiment, 50 PL were procured from CIFE hatchery, and divided into two groups of 25 each. One group was exposed to virus inoculum (tissue homogenate prepared from white tail disease-infected freshwater prawn samples collected from Kakinada, Andhra Pradesh). The inoculum was tested PCR positive for both MrNV and XSV. The experimental animals were exposed in a 500 ml glass beaker filled with the freshwater containing the inoculum for 2 hours, and later the animals were transferred into a glass aquarium. Twenty-five animals kept in another aquarium, which were not exposed to the viral inoculum served as control group. The experimental group showed mortality on the first day post-infection, and this could be attributed to the stress associated with the challenge procedure. Further, low level of mortality was observed in the tank everyday. However, control group also showed low level mortality, but not as high as that in the experimental group. The RT-PCR test of the moribund experimental animals did not show any positive amplification.

Days	Control	Tank-I	Tank-II	Tank-III
0	30	10	10	10
1	25	8	10	10
2	25	8	10	10
3	25	8	10	10
4	25	8	10	10
5	25	8	10	10
6	25	5	8	10
7	25	4	5	7
8	25	4	5	7

In the second experiment, wild-caught larvae of freshwater prawn collected from Gujarat state were used. Thirty animals were exposed to the viral inoculum as described above, and later separated/transferred into 3 aquaria (10 animals each). Thirty unexposed animals served as control. Following are the mortality/survival pattern observed in the experimental and control groups. However, RT-PCR conducted on representative samples from each tank did not show any amplification.

To test the quality of frozen tissues, extracted RNA and cDNA, repeated PCR tests have been carried out using the above mentioned primers. The 590 bp fragment of the RNA1 segment and 681 bp of RNA2 segments could be amplified from the freshly prepared cDNA using the old RNA samples (frozen).



However, cDNA samples made from the RNA extracted from two frozen tissue samples (presumptive) did not give any amplification. Further, amplification of 1.14 kb fragment of RNA2 segment was unsuccessful with all the samples. This needs to be tested with fresh infected samples and also with newly designed primers which could amplify smaller fragment from the same genomic region. Attempts will also be made to amplify the 1.14 kb region using long template PCR system.

To generate the full-length sequence information of Indian isolate of MrNV, 8 pairs of new primers are designed including primers targeted to amplify the capsid protein and polymerase encoding regions. These primers will be procured and different PCR conditions have to be standardized to generate the products for sequencing.

**Project Title: Bacterial biofilm in aquaculture and their potential uses**

**Personnel:** P. K. Pandey, C. S. Purushothaman, A. Vennila, S. P. Shukla

**Achievements**

Different substrata for the settlement of the biofilm-producing organisms including gravel, glass slides, tiles and wood were tried. Among these, wood has given better results in terms higher number of colony settlements, followed by gravel. Quantitative analysis of the isolates has been carried out. Qualitative analyses of the isolates are in progress. Apart from that, associated algae have also been characterized. Wood will be used for enhancement study of bacteria for increased fish production.

**THRUST AREA 2: GENOTYPE ENVIRONMENT INTERACTION STUDIES FOR ECONOMICALLY IMPORTANT TRAITS**

**Project Title: Genotype-environment (GxE) interaction studies of *Macrobrachium rosenbergii* for economically important traits**

**Personnel:** Gopal Krishna, S. Jahageerda, G. Venugopal, M. Abbas, N. K. Chadha, Somdutt

**Achievements**

The matured male and female prawn stocks were collected from different regions including Andhra Pradesh, Orissa and Gujarat. The Gujarat stock was discarded due to insufficient mating pairs. The remaining stocks were kept for captive breeding for



producing full-sib families. The successful berried females were spawned and larval rearing was carried out at the Shellfish Hatchery of the Kakinada Centre. A total of 10 and 13 families from Andhra Pradesh and Orissa stocks respectively were successfully obtained and were shifted to the cement nursery ponds of Fresh Water Fish Farm. The PL rearing is under progress for further experiments.

**Project title: Nutritional and biochemical responses of different *Macrobrachium rosenbergii* populations to varying environmental conditions**

**Personnel:** N. P. Sahu, A. K. Pal, K. K. Jain

#### **Achievement**

A feeding trial was conducted to study the interaction of different wild-stock of *M. rosenbergii* and dietary protein level on their growth and survival. Wild-stock juveniles of *M. rosenbergii* were collected from Gujarat ( $0.90 \pm 0.04$ - $1.06 \pm 0.08$  g), Maharashtra ( $0.80 \pm 0.07$ - $1.01 \pm 0.1$  g) and Andhra Pradesh ( $3.06 \pm 0.13$ - $3.10 \pm 0.23$  g) and stocked in culture pond of  $200\text{m}^2$  at 1 juvenile/ $\text{m}^2$ . All the animals were tagged individually with a particular colour assigned to each stock and acclimatized for 7 days before release to the pond. All the stocks were pooled together at a ratio of 75:70:55 (Andhra Pradesh: Maharashtra : Gujarat) and stocked in a pond. Either of the two feed (one low protein feed, 27% CP and other commercial feed, 32% CP) was fed at 6% of the body mass of the prawn in duplicate ponds for 60 days. Both protein level and stock type had a significant ( $P < 0.05$ ) effect on the weight gain percentage of the prawn. There was around 95% difference in weight gain due to change in CP % in the diet. Similarly Gujarat and Maharashtra stock exhibited significantly higher ( $P < 0.05$ ) growth rate of (approximately 90%) higher than the Andhra Pradesh stock, though there was no difference between the Maharashtra and Gujarat stock. However, there was no significant difference ( $P > 0.05$ ) due to interaction of stock and protein level. Survival rate among the different stock varied from 56-77% but there was no significant difference in survival rate among the different stock.

High protein fed group exhibited higher hemolymph glucose but, stock type did not exhibit any variation in the glucose content in hemolymph. Higher respiratory burst activity (NBT) was recorded in the higher protein fed groups. Maharashtra stock showed higher ( $P < 0.05$ ) NBT values than the Andhra Pradesh stock but similar to Gujarat Stock. Among the plasma fatty acid saturated fatty acids (SAFAs) contributed 50-70% with maximum contribution by C16:0 (31-36% of total fatty acid), while mono unsaturated fatty acids (MUFAs) and n-6 was

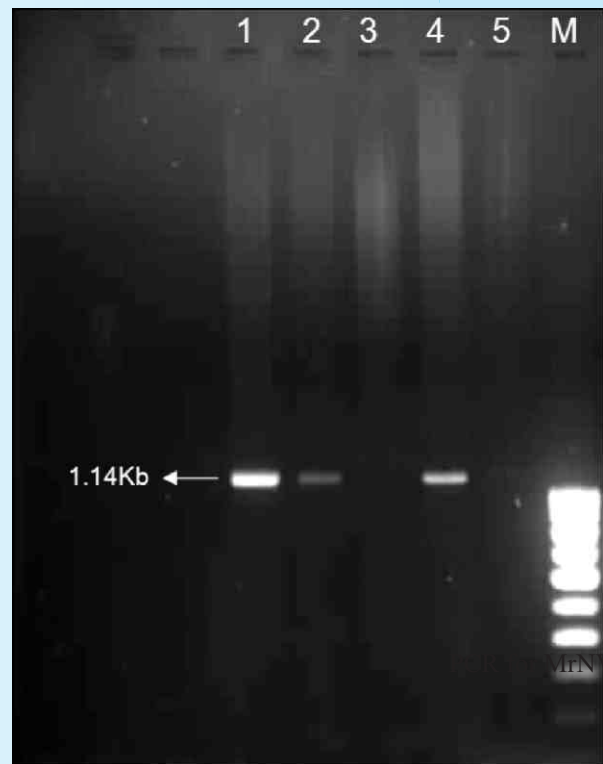
about 25.5-33.5% and 5.5-11.3%, respectively. The only fatty acid, C18:3 n-3 was found only in the Andhra Pradesh and Maharashtra stock at higher dietary protein level in the range of 0.15-0.30%. No higher chain fatty acid (>C20) was identified in any stock. No variation was found in plasma calcium level with respect to stock and protein level and it ranged from 26-29.5mg/dl among all the stocks.

**Project Title: Isolation, identification and characterization of common pathogens of *Macrobrachium rosenbergii* from selected stocks**

**Personnel:** M. Makesh, S. C. Mukherjee, K. Paniprasad, R. P. Raman, G. Tripathy

### Achievements

*Macrobrachium rosenbergii* post-larvae from Gujarat, Maharashtra and Orissa stocks maintained at Kakinada centre of CIFE reported of white-tail disease outbreak, were collected in ice and alcohol. Some of the infected PLs were also transported live to the pathology lab. The PLs had characteristic white tail and muscle suggestive of white-tail disease. The samples were processed for the confirmation of white tail disease by PCR using primers reported earlier. Total RNA was extracted from the infected tissues and cDNA was synthesized. A product of 1.14 kb was amplified on PCR which pertains to the RNA-2 of MrNV. The same cDNA sample was used for PCR for XSV using specific primers. A PCR product of 772 bp was obtained upon amplification with primers specific for XSV. Experimental infection of PLs was carried out in the laboratory. Healthy *M. rosenbergii* PLs obtained from the CIFE hatchery were infected with the infected PLs collected from Kakinada. Tissue suspension in PBS was filtered through 0.22 $\mu$  syringe filter was added to the culture tank. The PLs were observed for 2 weeks. Characteristic lesions and mortality pattern were not observed in the experimental infection. A lower mortality rate and slight discolouration of the musculature was observed. However, PCR for MrNV and XSV were negative. Samples were also collected from the CIFE hatchery and subjected to PCR for MrNV and XSV. The samples were negative for both the viruses. On bacteriological and fungal





examination, *Aeromonas hydrophila* was detected. No fungus was detected in the samples. Microscopic examination did not reveal any parasites. Subsequent sampling of *M. rosenbergii* post-larvae and juveniles maintained at CIFE was done and the samples were tested for the presence of MrNV and XSV as mentioned earlier. However no virus was detected in any of the samples. The samples were also screened for fungal pathogens using GP broth, Sabourauds media and buffered yeast agar. No fungus could be isolated from any of the samples. Samples were also investigated for the presence of parasites. No parasite could be found externally or internally from tissues such as musculature, appendages and gills. The *hyrophila* isolated from *M. rosenbergii* was characterized. The isolate was Gram negative, Gelatinase positive, motile, straight rods, resistant to Ampicillin, Penicillin, Bacitracin, and sensitive to Chloromphenicol, Tetracycline and Sulphonamide, Oxidase positive, and Glucose fermenting.

### THRUST AREA 3: NON-FOOD ORGANISMS IN AQUACULTURE

**Project Title: Selective breeding programme for ornamental fishes.**

**Personnel: M. P. S. Kohli**

#### **Achievements**

Goldfish, *Carassius auratus* (Linnaeus, 1758) and Fighter fish, *Betta splendens* (Regan, 1910) were procured from Kolkata and Mumbai fish markets. After conditioning to the local environment, they were reared for breeding. Having raised up to maturity stage, 500 sets each of Goldfish and Fighter fish were kept for breeding. The fecundity rate of Gold fish was in the range of 500 to 3000 numbers of eggs, while for Fighter it was 400 to 1200 numbers of eggs. The rate of survival for the young ones of Goldfish was 30%, while it was 20% for that of Fighter fish.



Overview and inside view of Ornamental fish seed hatchery



**Project Title: Extraction of natural carotenoids to use as feed additives in ornamental fish feed**

**Personnel:** A. Sinha, S. D. Singh, G. H. Pailan

**Achievements**

The carotenoid content of muscle and skin of some indigenous and exotic fishes has been estimated. Mean total carotenoid level in flesh and skin in different indigenous ornamental fishes are as follows: *Botia lohachata* (Y Loacu) 2.13 µg/g; *Puntius saphori* (Sophore barb) 1.60 µg/g; *Puntius conchonius* (Rosy barb) 2.40 µg/g; *Colisa fasciatus* 2.80 µg/g and *Chanda ranga* 1.70 µg/g. In exotic ornamental fishes, the average carotenoid content was (µg/g) as follows: *Cararrius auratus* (Gold fish) - 1.67; *Cyprinus carpio* (Koi carp) - 3.60; *Poecilia reticulate* (Guppy) - 3.87; *Poecilia maculates* (Molly) (silvera) - 1.60; *Poecilia maculates* (Molly) (black) - 2.40; *Xiphophorus variatus* (Platy) - 3.60; *Xiphophorus helleri* (Sword tail) (orange) - 2.80 and *Puntius tetrazona* (Tiger barb) - 2.80. Among the all fish species under study, the carotenoid content was minimum in Sophore barb and Molly (silvera) and was maximum in Guppy.

**THRUST AREA 4: SUSTAINABLE FISHERIES DEVELOPMENT THROUGH CO-MANAGEMENT**

**Project Title: Developing strategies for fisheries enhancement of Dimbhe reservoir, Maharashtra through management interventions and community participation**

**Personnel:** M. P. S. Kohli, N. Saharan, K. Dube, L. Shenoy, V. K. Tiwari, Chandraprakash and S.Salim

**Achievements**

Pre-monsoon, monsoon and post monsoon samples of the reservoir were studied for the physico- chemical parameters and biological parameters. The aquatic net productivity was in the range of 225 to 250 mg C/m<sup>3</sup>/day.

About 500 kg of green manure crop Daincha was planted in about 3-4 hectares in exposed areas of 4 villages to enhance the produculation of the reservoir. Soil organic carbon got increased from 0.45 to 0.70%



A view of *Daincha* plantation



Cage construction and shifting of cages.

The plankton population of the reservoir was poor. Fish species recorded in the reservoir included *Labeo rohita*, *Catla catla*, *Cirrhinus mrigala*, *Cirrhinus reba*, *Ompok pabda*, *Puntius spp.* *Labeo calbasu*, *Chela spp.*, etc. Under the enhancement programme, during last one year 11, 93,000 advance fry and fingerlings of Catla, Rohu and Common carp were stocked in the reservoir. Out of this, 2.6 lakh fry were reared to fingerlings in Phulawade pond and 3 lakh were in quarry.

Cage culture programme was taken up with community participation through NGO “Shaswat”, working for rural development. A set of four cages (HDPE, 3m x 3m x 3m) were stocked with 3,500 (200 No./m<sup>3</sup>) common carp fry (35-50 mm and 1.0 to 1.5 g) in each cage. After rearing for a period of nine months, a total of 4250 advance fingerlings (100 to 140 mm) were released in the reservoir. In January 2008, a set of sixteen cages of HDPE, 3m x 3m x 3m, mesh size 6 mm having 3m x 3m x 2m effective water depth was installed in the reservoir. The cages were having 1 m free board. Cage 1-4 were stocked with common carp of 25 mm, 0.256 g @ 2,700 No./cage (150 No./m<sup>3</sup>), cage 5-12 with common carp of 20.59 mm 0.248g @ 2,250 No./cage (125 No./m<sup>3</sup>), cage 13-15 with common carp 56.87 mm, 1.11g@900 No./cage (50 No./m<sup>3</sup>) and cage 16 with 33.20 mm, 300 No./cage (16.67 No./m<sup>3</sup>) gold fish. Cages are being maintained and growth is observed regularly.



A battery of cages in Dimbhe reservoir

**Project Title: Development of a fisheries co-management model for selected coastal segments of Maharashtra**

**Personnel:** S. K. Chakraborty, S. N. Ojha, K. Venkateshvaran, G. Deshmukhe, A. K. Jaiswar

**Achievements**

Biodiversity estimation was done from Kundalini river at Revdanda and Agrava village and also from Dharmatar creek near Nippon Dendron Ispat Company. The BOD levels were high, indicating pollution in the water bodies. The high nitrite content also was found in the water bodies. The presence of *Coscinodiscus* in the sample also proves that pollution is persisting and because of it the presence of other plankton is low. The degradation of mangrove vegetation at Kundlika river is mainly due to sand mining and effluent discharged from MIDC. The fish catch was also recorded from the landings as well those left on the platform for drying. *Thryssa* spp., *Acetes* sp., *Stolephorus* spp., *Coilia dussumeri* and penaeid prawns were recorded. PRA of Revdanda village was done. There are about 250 families of which 150 are Hindu and Jain and about 100 Muslims with fishing and related activities as main source of livelihood. All the people below 50 years of age are literate. The problem faced by the fishers is unemployment, and pollution caused by the industries. Pollution has resulted in depletion of the catch and also causes mass mortality. Sand mining is destroying the mangrove vegetation and also the bottom flora and fauna. The opportunities perceived were that the fish drying and packing with a regular platform for the same. The fishers too can be given the right to sand dredging which may result in judicious exploitation of the resources; thus saving the mangroves also. Aquatourism can be promoted in this area, as an alternative economic activity.

**Project Title: Development of a participatory extension model for aquaculture**

**Personnel:** P. S. Ananthan, S. S. H. Razvi

**Achievements**

*Chanos chanos* (Milk fish) seeds were stocked in 0.4 ha pond @10000/ha. Regular feeding, water and soil management and monthly sampling for growth was carried out. The total weight obtained from harvest was 430 kg for a total number of 2660. *Scylla tranquebarica* (Green crab) culture was also tried under participatory aquaculture model. A total number of 1200 crablets were



procured from a private crab hatchery at Chennai and were stocked in four ponds of 0.08 ha each. Crab culture was practiced at brackish water farm for 110 days. A total of 56.35 kg crabs were harvested. Crab farmers were contacted at Amalapuram including one result demonstration farmer and fellow farmer for demonstrating crab farming in 25 ponds.

## THRUST AREA 5: POLICY FRAME WORK FOR INDIAN FISHERIES AND AQUACULTURE

**Project Title:** Developing appropriate policy framework for the development of fisheries and aquaculture

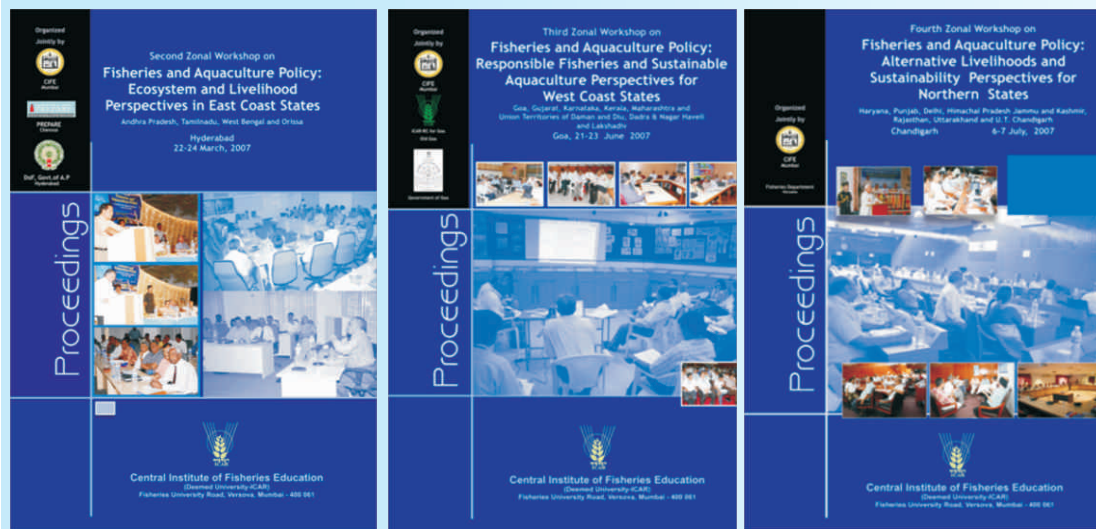
**Personnel:** Dilip Kumar, R. S. Biradar, S. N. Ojha, L. Shenoy, A. Sharma, B. B. Nayak, S. Salim, P. S. Ananthan, R. P. Raman, A. Vennila.

### Achievements

The project aims to prepare a policy framework for the development of fisheries and aquaculture in India. A participatory approach is envisaged in this

project to gather opinion of different stakeholders. Summary of the progress as follows: *Policy Review:* The review of the policy and regulatory environment at the national level has brought out inadequacies in the present fisheries and

aquaculture policy framework, while the international policy scenario is very encouraging. As planned, five zonal level consultative workshops on 'Fisheries and Aquaculture Policy' have been successfully conducted under the project at Guwahati for North Eastern States, Hyderabad for East Coast States, at Goa for West Coast States (June 2007), at Chandigarh for Northern States (July 2007), and at Patna for Central States (October 2007). These workshops provided a platform where the policy issues, gaps and HRD needs of the respective zones were addressed and discussed in a truly consultative and participatory mode, evoking intense interest and introspection among all the stakeholders. The output and recommendations of the workshops provided essential ingredients



that would assist the states, in developing their own State fisheries policy. The workshops have also brought out several cross sectoral issues confronting the fisheries sector and their interdependent nature. The workshops have yielded some specific inputs for developing the policy framework at Central and State levels. A workshop was held at the Institute during 15-20 December, 2007, for synthesizing the proceedings of five zonal workshops conducted earlier. The proceedings of five zonal workshops have been prepared and being sent to different stakeholders, the policy makers and development planners.

*Policy Support:* One significant outcome of the project was, the interest shown by State Department of Fisheries for development and policy support. Accordingly, policy development support was provided to the Fisheries Department of Bihar, Tamil Nadu and Assam.

*Policy Framework:* Based on the consultative workshops and literature review, a detailed framework consisting of policy issues, policy status, and policy options on 8 sub sectors of fisheries and aquaculture are being prepared.

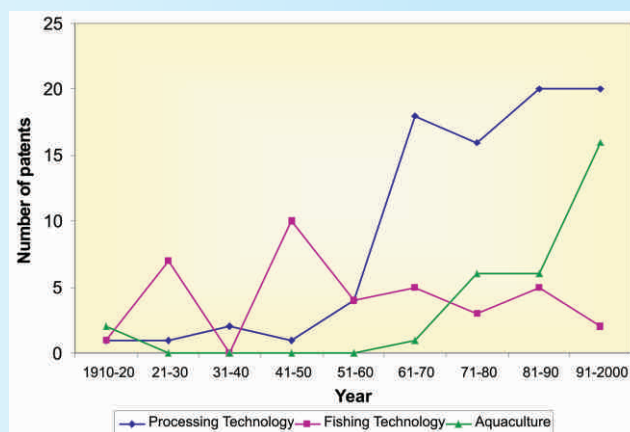
**Project Title: An empirical study of patents and patenting activity in the fisheries sector**

**Personnel:** Arpita Sharma, G. Venkateswarlu, Gopal Krishna, B. B. Nayak, P. S. Ananthan,

**Achievements**

The project has the objectives to compile Indian, US and European office patents in fisheries sector (1985-2005) as per the International Patent Classification (IPC) codes related to fisheries. Under the project, methodology for patent documentation was finalized as per the IPC version 8.0. Indian patents were documented from Gazette of India, and Patent Office, Mumbai. Indian patents in fisheries sector were documented (since 1913) and cross sectional analysis of patents was undertaken. A total of 151 patents in fisheries sector were documented and further classification as per specialization was done.

Case study of patented hatchery for carp eggs (Patent number: 144378) and hatchery cum spawnery (patent number: 147080) by TMBRS, Bombay has been performed. Thus, the patent rights have not been exploited to the fullest. Also the patent was renewed only for a period of 5 years after which it was discontinued. Compilation of Indian, US and European patents in fisheries sector as per the IPC codes related to fisheries (1985-2005) from the patent search software is in progress.



Trend in patenting activity in fisheries sector in India (1913-2000)

## THRUST AREA 6: QUALITY ENHANCEMENT IN FISH

**Project Title: Development of improved quality ready to eat fish products and study of their storage characteristics in retortable pouches**

**Personnel:** S. Basu, B. B. Nayak, G. Venkateshwarlu

### **Achievements**

Sandwich paste was prepared from Sciaenid fish and was fortified with and Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA) at different level using cod liver oil as a source at 0.5, 1, and 2% concentration. To standardize the heat process schedule ( $F_0$  value), the paste was subjected to different heat process schedule having  $F_0$  value of 4, 5 and 6 and different temperatures of 116.1, 121.1 and 126.1°C. The samples obtained were subjected to organoleptic evaluation by 10 panel members. It was found that heat process schedule of  $F_0 = 4$  at 121.1°C, yielding the best acceptable product. The product was then subjected to microbiological analysis and was found safe and free from *Clostridium botulinum*. The storage study of the product is in progress. 0, 15, 30, and 90 days analysis have been completed. The storage study will reveal the changes in the unsaturated fatty acids including EPA and DHA and their effect on organoleptic quality, if any.

**Fish curry in retortable pouch:** Fresh water fish Tilapia (*Oreochromis mossambicus*) was procured and analyzed for proximate composition, colour, texture and fatty acid composition. Cooking stability of tilapia steaks was studied by steam cooking for 1, 2, 3, 4, 5, 7, and 10 minutes and was subjected to colour, temperature and sensory evaluation. The steaks were also subjected to dip-treatment in different salt concentration for different time interval and then steam cooked at different time intervals. It was found that 1 hr dip in 10% salt solution, followed by steam cooking for 5 min gave the best cooking stability. Different recipes were tried to prepare fish curry in South Indian style and subjected to sensory taste by panel members. A recipe was finalized. Fish cubes were prepared by using minced meat from tilapia, 2% salt and different concentration (2%, 5%, 10%) of tapioca starch as binding agent and steam cooked. Texture was best with 2% tapioca starch. Curry was prepared with these cubes and the recipe was standardized by organoleptic evaluation.

**Project Title: Studies on oxidative stability of polyunsaturated fatty acids during extrusion cooking**

**Personnel:** G. Venkateshwarlu, S. Basu, B. B. Nayak



## Achievements

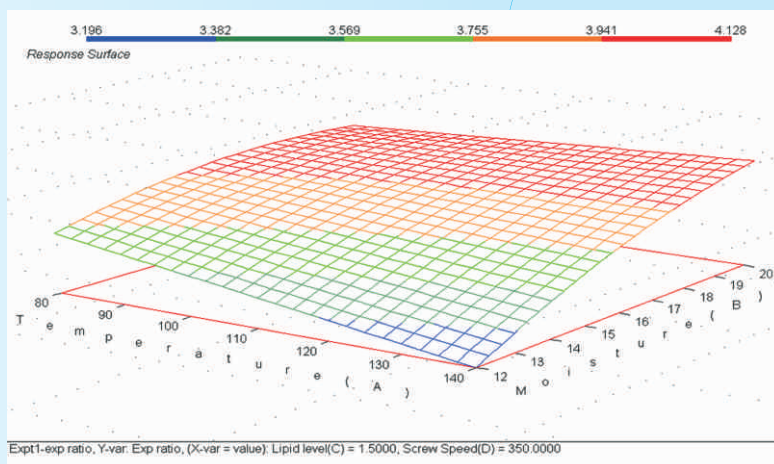
Functional snack foods can be produced by twin screw extruder by incorporation of fish oil containing omega-3 PUFAs especially Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA). However, the major challenge of extrusion cooking is the lipid oxidation. Expansion is another important parameter of an extruded product in terms of its functional properties. Product quality can vary considerably depending on the extruder type, feed moisture, and temperature profile in the barrel session, feed rate, moisture etc. Thus, the expansion characteristics of fish oil enriched extruded products have been studied using Response Surface Methodology.

Four variables namely feed moisture, temperature of the barrel, screw speed and lipid level were selected to study their effect on the expansion characters of the products and the oxidation stability of the added lipid. In order to study the effect of these variables, the response surface methodology has been followed by adopting central composite design. Based on the results of extrusion runs carried out

using different lipid sources, the following ranges for different variables have been selected for designing the experiment: feed moisture (12, 14, 16, 18, 20 %), temperature of the barrel (80, 95, 110, 125, 140 °C), screw speed (300, 325, 350, 375, 400 rpm) and lipid level (0.5, 1.0, 1.5, 2.0, 2.5 %)

The samples were made in twin-screw extruder as per the design by using rice-corn-Bengal gram blends. The measured expansion ratio (response variable) of extrudates along with design variables were subjected to response surface methodology by Unscrambler software. As moisture of the raw material increased, the expansion ratio was found to increase. The expansion ratio decreased gradually, with increase in temperature of the barrel. However, at high moisture levels, the expansion remained constant at all the temperatures studied in the experiment. Though screw speed of twin-screw extruder had no significant effect on expansion ratio, the expansion of the products was found to decrease with increase in the inclusion levels of lipid. The results of the experiment clearly demonstrated that temperature and moisture are powerful variables for changing the expansion properties of the extrudates.

In order to evaluate oxidative stability of extruded products, Thiobarbituric acid (TBA) value of all the samples was measured. Based on the response plots



Effect of temperature and moisture on expansion ratio

derived from response surface methodology, it was observed that the TBA value increased with increase in the inclusion level of fish oil and moisture content. But, surprisingly the TBA values decreased with increase in temperature. It might be due to the reduced expansion caused by the increase in temperature. Similar to the response on expansion ratio, the screw speed had no significant effect on TBA value. Effect of inclusion level of fish oil on TBA was found more significant among different parameters studied in the experiment.

**Project Title: Studies on safe and effective chemical control measures for floating and submerged aquatic weeds affecting aquaculture**

**Personnel:** S. Datta, B. K. Mahapatra, P. Sardar, S. Arora.

#### **Achievements**

Floating weeds like water hyacinth, Pistia (late vegetative stage) were collected from field condition and placed in fibre tanks containing 500 l water. After 3 days of acclimatization, treatment was done with 2, 4-D (Killweed 80% WP) and Glyphosate (Roundup 41% SL) for screening. Herbicides were applied at three different doses i.e. @0.25, 0.5 and 1.0% solution for Glyphosate and @ 5, 10 and 15 kg/ha for 2, 4-D. The percentage kill was recorded after 5, 10 and 15 days after treatment. It was observed that 80% weeds were killed within 10 days of application at 10 kg/ha of 2, 4-D and at 0.5% of glyphosate for both the weeds, whereas 100% kill was observed by 15 days in most of the cases at 15 Kg/ha of 2, 4-D and 1.0% of glyphosate, except after 5 days, which were more than 90% for water hyacinth and more than 80% for Pistia. 100% kill could not be achieved even after 15 days for both the weeds at 5 kg/ha 2, 4-D and 0.25% Glyphosate. From the above observation, it is inferred that a dose of 10 kg/ha of 2,4-D or 0.5% of Glyphosate may be ideal to obtain 80% kill of water hyacinth or Pistia by 10 days after application.

**Project Title: Physico-biochemical effects of arsenic and strategic approaches to reduce residual arsenic in fish.**

**Personnel:** P. Sardar, B. K. Mahapatra, G. H. Pailan, S. Datta

#### **Achievements**

A survey was conducted in Kolsur and Hadipur Jhikra I Gram panchyat (GP) of Deganga Block, North 24 Parganas, Chandpur and Adampur GP of Howrah Block, North 24 Parganas, Baruipur I and Ramnagar GP of Baruipur Block, South



24 Parganas and Belda GP of Narayangarh Block, Midnapore, West Bengal. Groundwater (shallow tube well water & shallow pump water), pond sediment, pond water (surface, column and bottom), plankton, benthos, aquatic weeds, fish tissues, duck meat and duck egg were collected for the estimation of total arsenic. The highest total arsenic concentration (mg/l) was observed in each element of Kolsur GP followed by Baruipur I GP, with the lowest concentration in the elements of Belda GP. The highest concentration of total arsenic was found in pond sediment followed by benthos, plankton and aquatic weeds with the lowest concentration in surface pond water of every GP. Fish samples, duck meat and eggs of Kolsur GP also showed the highest total arsenic concentration. Among different fish, bottom dwelling Common carp and Mrigal had higher level of total arsenic followed by column dwelling Rohu and surface dwelling Catla. Among different tissues studied, liver of each fish had higher concentration of total arsenic followed by kidney, and muscle. Duck organs also showed the similar trend. Among different components of egg studied, yolk contained higher concentration of total arsenic followed by albumen, and shell.

**Project Title: Nutritional strategies to mitigate physio-pathological effects of endosulfan in fish**

**Personnel:** Sanjay Jadhao, S. Gupta and S. Munilkumar

#### **Achievements**

Fish (*Labeo rohita*) was exposed at LC-50 level of endosulfan with or without methyl donor supplement. The feed utilization, biochemical and enzyme profile were studied and the significant reversal of negative effect was achieved in the methyl donor supplements. LDH and MDH enzyme activities were significantly decreased in methyl donor supplement while increased in endosulfan exposed in compare to control. Similarly Acetyl choline esterase activity was increased in methyl donor supplement while decreased in endosulfan exposed. No significant change on other enzymes activities in both tissues (Liver and muscle) was found.

**Project Title: Mapping of marine algae along Maharashtra coast**

**Personnel:** G. Deshmukhe

#### **Achievements**

Out of 16 stations previously selected, 5 stations have potential seaweed



growth that can be harvested. These stations are viz: Dahanu (*Ulva lobata*), Colaba, Mumbai (*Gracilaria folifera*, *Padina*), Srivardhan (all the brown algal species, particularly Dictyotale members and *Sargassum*, *Amphiroa fragilissima*), Ratnagiri (*Sargassum*, *Enteromorpha*), and Malvan (*Porphyra*, *Padina*, *Caulerpa*, *Spatoglossum*, *Ulva*, *Enteromorpha*). Most of the algal biodiversity is found in the mid littoral zone.

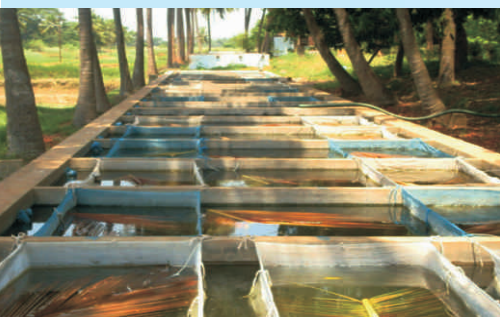
Human interference at Malvan in the form of Increase in tourism has resulted into loss of biodiversity. However sturdy or opportunistic forms are dominant and are contributing to the biomass.

## 4.2 Externally Funded Projects

### 1. Project Title: Development of auto-transgenic Asian Catfish, *Clarias batrachus* (L)

**Funding Agency:** NFBSRA, NAIP funded CCMB, Hyderabad as collaborating partner

**Personnel:** G. Venugopal, J. K. Prasanth, K. R. K. Reddy



#### Achievements

The fingerling stocks were brought from different regions of the country viz., Andhra Pradesh, Orissa, Haryana and Bihar, and stocked in the ponds. All the stocks are being maintained separately at Freshwater Fish Farm, Balabhadrapuram for brood stock raising purpose. A live feed culture unit was also established.

### 2. Project Title: Nutritional requirement, feed development and feeding strategies of indigenous freshwater ornamental fish having export values

**Funding Agency:** ICAR (APCess Fund)

**Personnel:** A. Sinha, P. Sardar

#### Achievements

The dietary requirement of protein and lipid in *Colisa fasciatus* was studied by formulating seven isoenergetic (401.91 kcal/100 g) and heteronitrogenous (20-50% crude protein levels) and another six isonitrogenous (35.04% CP level) and heteroenergetic (2-12% lipid levels corresponding to 340-440 kcal/100g gross energy levels) experimental diets respectively. Twenty fish were

randomly stocked into triplicate tanks for each of seven treatments (PT<sub>1</sub>, PT<sub>2</sub>, PT<sub>3</sub>, PT<sub>4</sub>, PT<sub>5</sub>, PT<sub>6</sub> and PT<sub>7</sub>) for study of protein requirement and also for each of another six treatments (LT<sub>1</sub>, LT<sub>2</sub>, LT<sub>3</sub>, LT<sub>4</sub>, LT<sub>5</sub> and LT<sub>6</sub>) for the study of lipid requirement in *Colisa fasciatus*. All the experimental fish were again acclimated to the respective experimental diet for one week before the actual experimental feeding. All groups of fish were fed with their respective diet to apparent satiation with two equal parts of daily ration at 09:00 and 17:00 hours for 8 weeks period. Fish were weighed every fortnight and the daily rations adjusted accordingly. Daily water temperatures were recorded at morning and evening and water samples were collected fortnightly for water quality analysis. Different performance parameters like FCR, PER, SGR, survival percentage were analyzed as per the standard method.

One-way ANOVA (Snedecor and Cochran, 1994) and Duncan's multiple range test (Duncan, 1955) were used to analyze the significance of the difference among the means of treatments by using Compare Means (SPSS, 1997). Optimum dietary protein and lipid requirement for juvenile *Colisa fasciatus* were determined by fitting the percent weight gain of fish to second order polynomial regression analysis (Mercer *et al.*, 1989) and broken line regression procedure to determine the break point (Robbins *et al.*, 1979).

*Colisa fasciatus* fed with PT<sub>3</sub> and PT<sub>4</sub> feed showed significant increment (P<0.05) in weight gain when compared to other feeds. But no significant (P<0.05) weight gain was observed between fish of PT<sub>3</sub> and PT<sub>4</sub>. PT<sub>3</sub> showed better weight gain compared to the other feed. FCR, SGR and PER showed better performances with those aforesaid feeds. By applying second order polynomial regression analysis and broken line regression procedure to determine the break point, optimum protein requirement for *Colisa fasciatus* was 30-35%. Irrespective of the lipid sources used, *Colisa fasciatus* fed with LT<sub>4</sub> feed showed significantly (P<0.05) higher FCR, growth rate and weight gain followed by the fish fed with LT<sub>5</sub>. This study revealed that the optimum lipid requirement of *Colisa fasciatus* is in the range of 8-10% with the corresponding energy values of 400-420 kcal/100g.

### **3. Project Title: Ornamental fish breeding and culture, an innovative scheme for the development of rural women**

**Funding Agency: Department of Biotechnology (DBT), Government of India**

**Personnel: A. Sinha, P. K. Roy**

#### **Achievements**

Two locations were selected to impart the training on ornamental fish culture, based on the PRA, group discussion and meetings with NGOs, village Panchayat authority and members of the area i.e. (a) Sewli Gram Panchayat Debpuhur, Barrackpore and (b) Raychak, Kamar pool, Diamond Harbour Road.

Groups were formed by identifying the interested women from the selected location. In each group there are 25 women registered for the training. The selected members were introduced to the ornamental fish farms located at Amtala to appraise the working possibilities and viability of the project. Construction of infrastructure (one set) for demonstration and training of ornamental fish breeding to the women group is completed at Sewli Gram Panchayat, Debpuhur, Barrackpore and under process at Roychak, Kamar Pool, Diamond Harbour Road, Kolkata.

### **4. Project Title: Bacterial fertilizers for organic aquaculture**

**Funding Agency: ICAR (AP Cess Fund)**

**Personnel: P. K. Pandey, C. S. Purushothaman, A. Vennila**

#### **Achievements**

Characterization of nitrogen-fixing, phosphatase-producing and phosphorus-solubilising bacteria has been completed. Nitrogenase and Phosphatase activities of the isolates were measured based on the standard protocols. Carrier materials have been analyzed. Three materials, namely charcoal, saw dust and Fuller's earth were analyzed as carrier materials. Charcoal has given the best result as shelf-life and multiplication of colonies were longer and faster, respectively.



## 5. Project Title: Mapping of microbial diversity in the marine ecosystem in and around Mumbai

**Funding Agency:** ICAR (Application of Microorganisms in Agriculture and Allied Sectors)

**Personnel:** C. S. Purushothaman, P. K. Pandey, A. Vennila

### Achievements

Cultures isolated from the intertidal zones along Mumbai coast were tested for their tolerance to increasing concentrations of NaCl (2.5% to 30%). Protein profiling of Gram-positive and Gram-negative isolates tolerant to concentrations of greater than or equal to 10% salt was carried out. 1D-Proteomics of the isolate N2 in the presence and absence of external assistance of compatible solute, trehalose, under salt stress was also done.

In the salt tolerance experiment performed, only seven isolates tolerated up to 30% NaCl concentration, three tolerated up to 25% and not beyond, ten isolates tolerated up to 15% and not beyond, 42 tolerated up to 10% and not beyond, and 11 tolerated up to 5% and not beyond. Protein profiling of these isolates were carried out. Most of the diversity of the Gram-positive salt-tolerant isolates seems to be limited to the genus *Bacillus*. Although, other Gram-positive isolates were present, including many micrococcal isolates, the *Bacillus* isolates seem to withstand salt stress.

The protein profile was analyzed using non-metric multi-dimensional scaling with a 2D-plot using Correlation similarity measure distance. The clustering of points indicates the similarity between the conditions set. The three points corresponding to 1, 2 and 3% NaCl without trehalose are coinciding. At the same time, though not clustering, the points corresponding to 1, 2 and 3% NaCl stress with the assistance of trehalose are showing a similar profile, plotting close by. The marked absence of a higher molecular weight band from those N2 tubes not cultured in the presence of trehalose could indicate the repression of some systems governing endurance to salt. The absence of one band is accompanied by the intensification of a band just below it. Another band of lower molecular weight was seen in those cultures growing in the presence of trehalose, but not in the absence of it.

## 6. Project Title: Development of bacterial consortia for bio-processing agricultural wastes and bioremediation of aquaculture effluents

**Funding Agency:** ICAR (Application of Microorganisms in Agriculture and Allied Sectors)

**Personnel:** C. S. Purushothaman, A. Vennila, P. K. Pandey

#### **Achievements**

Analysis of the paddy field soil samples brought from Berhampur (Orissa) and Bharuch (Gujarat) was carried out. Whatman filter paper was used as the complex cellulose substrate to study the cellulolytic property of the isolates. A comparison with the control showed cellulolytic activity by two isolates.

The profile was obtained with ARDRA of the Bharuch isolates using three restriction enzymes, *AluI*, *HaeIII* and *MboI*. The profile was used to construct the Dendrogram using the AlphaEase 3.0 software, with UPGMA clustering. *Nocardia farcinica* and *Pseudomonas alcaligenes* could be identified. The whole-cell protein profile was obtained from the six isolates of Orissa. Because of the lack of enough bands in the profile, it would be statistically inappropriate to use the profile for the construction of a Dendrogram. However, since, all the six are Gram-positive cellulolytic aerobic Bacilli, it is quite probable that they are closely related. CMC agar was used to estimate the efficiency of the isolates in the decomposition through the zone of clearance. Congo red in this case binds only to the cellulose which is polymeric in nature. The zone of clearance indicates degradation of cellulose.

Aquaculture effluent samples from shrimp farms located at Thiruvangoor (Kerala) were collected to study the physico-chemical parameters of the effluent and also to isolate ammonia-oxidizing and nitrite-oxidizing bacteria. The isolation of ammonia-oxidizing and nitrite-oxidizing bacteria is in progress.

#### **7. Project Title: Utilization of inland saline and sodic soil resources for aquaculture**

**Funding Agency:** ICAR (Niche Area of Excellence)

**Personnel:** C. S. Purushothaman, P.P.Joshi, U.K.Maheshwari, S.Raizada, N.K.Chadha

#### **Achievements**

A consignment of Milkfish and Mullet obtained from Mandapam (Tamil Nadu) and stocked in the pond of 6‰ salinity on March 13, 2007 was maintained and fed regularly along with pond fertilization. After six months of culture, the

average growth observed was 200 mm/130 g in the case of mullet and 360 mm/400 g in the case of milkfish from the initial size of 10 mm/0.4 g and 30 mm/4 g, respectively.

Mullet seed procured from Kochi (Kerala) on August 25, 2007 was stocked in two lined ponds of 200 m<sup>2</sup> area each having 20‰ at 25,000/ha. After two months of rearing, the average size achieved was 90 mm/12 g. Mullet and milkfish seed procured from Mandapam on September 05, 2007 was stocked in two lined ponds of 0.1 ha each with 20‰ salinity at 30,000/ha after 10 days of conditioning indoors. Tiger shrimp seed from Chennai (Tamil Nadu) procured on September 19, 2007 was stocked on October 03, 2007 in six lined ponds of 200 m<sup>2</sup> each of 20‰ salinity after indoor rearing. Necessary amendment with potassium was done before stocking. Tiger shrimp seed procured from Kakinada (Andhra Pradesh) on September 11, 2007 was reared indoors at 5‰ salinity up to October 05, 2007. The survival rate was only 25% and these were stocked in a 200 m<sup>2</sup> pond of low salinity for rearing. The wet laboratory constructed under the project. This facility is being used for indoor experiments.

**8. Project Title: Development of monoclonal antibody-based rapid diagnostic test for the detection of *Macrobrachium rosenbergii* Nodavirus (MrNV) and Extra Small Virus (XSV) of *Macrobrachium rosenbergii***

**Funding Agency:** DBT, New Delhi

**Personnel:** M. Makesh, K. V. Rajendran

**Achievements**

White tail disease infected post-larvae of freshwater prawn *Macrobrachium rosenbergii* were collected from a hatchery at Kakinada, Andhra Pradesh. Total RNA was extracted from the frozen samples and cDNA was synthesized using random hexamer primers. The samples were checked for the presence of MrNV and XSV using the following specific primers encoding the capsid protein gene of MrNV and XSV. Upon PCR a specific amplification product of 1.14 kb for MrNV and 772 bp for XSV were obtained.



New primers were designed with BamH1 and EcoR1 restriction sites in the forward and reverse primers for gene encoding the capsid protein of MrNV and XSV. The primer sequences are as follows.

MRNV F1 : 5'- CGC GGA TCC GCG ATG GCT AGA GGT AAA CAAAAT TC-3'

MRNV R1 : 5'- GGAATT CCA CAA CCT AAT TAT TGC CGAC-3'

XSV F1 : 5'- CGG GAT CCC GTA GGG GAC GTG GTAGGACA-3'

XSV R1 : 5'- GGAATT CCA CAA TTG GCC ATAAGG GTT TTC-3'

The capsid protein genes of MrNV and XSV have been amplified by PCR using the new primers with restriction sites. The 1.14 Kb PCR products of MrNV and pRSETA vector were digested with BamH1 and EcoR1, gel purified and ligated. The ligated product was transformed into DH5 $\alpha$  cells and plated on LB agar plates with ampicillin. Fourteen of the colonies on the LB agar plate were screened by colony PCR. Out of the fourteen colonies, four colonies were PCR positive. Out of the four colonies three were inoculated into LB broth containing ampicillin and incubated overnight. Plasmid was purified from the overnight culture. The presence of the insert in the plasmid was checked by digesting the purified plasmid with BamH1 and EcoR1 enzymes. Upon digestion of the recombinant plasmid with these enzymes a 1.14 kb product was released from the plasmid

#### **9. Project Title: Development of Immunodiagnostic kits for viral diseases of freshwater prawn *M. rosenbergii***

**Funding Agency:** DBT, New Delhi

**Personnel:** K. Paniprasad

#### **Achievements**

Purification of anti Noda virus rabbit IgG from hyper immune sera for preparation of reagents was carried out. Immunoassays such as ELISA and dot ELISA were standardized using the purified IgG for detection of Noda virus. Amplified Mr.NV capsid gene and cloned in Plasmid expression Vector (pPROEX HTa). But the expression was not found due to unknown reason.

#### **10. Project Title: Indo-Australian bilateral research project on "Aquaculture in degraded inland areas in India and Australia"**

**Funding Agency:** ICAR and ACIAR (Australian Centre for International Agricultural Research)



**Personnel:** S. Raizada, N. K. Chadha, A. K. Reddy, A. K. Verma, M. Ali, A. Kumar, H. Javed, S. Kumar

### **Achievements**

(i) Activity: To evaluate survival and growth of giant freshwater prawn (*Macrobrachium rosenbergii*) in raw and potassium amended inland ground saline water at 5 and 10 ppt salinities

A 45-days experiment was conducted to evaluate role of potassium amendment in inland ground saline water of 5 and 10 ppt salinities during September-October 2007. The experiment was conducted in triplicates with two treatments of 5 and 10 ppt salinities ground saline water amended with potassium equivalent to coastal seawater. FRP tanks of 500 litre capacity were stocked with 120 PL (average size length 15.5 mm, weight 0.0258 gm). The raw ground saline water of the same salinity was used as control. The PL was fed ad-libitum with commercial prawn feed and 40% of the tank water was changed daily. The tanks were harvested after 45-days of rearing. A significant high survival and growth was observed in treatment than the control. Post larvae stocked in 5 ppt and 10 ppt treatment waters showed a uniform survival of 81 %, which was observed double than the control (42%) , in case of 5 ppt salinity water whereas, total mortality was observed in control water of 10 ppt salinity. The growth was also observed insignificant in both the treatment whereas it was significantly poor in control water at 5 ppt salinity. The study thus confirmed that addition of potassium could significantly enhance survival as well as growth of prawn than the raw inland ground saline water at 5 ppt salinity and addition of potassium is essential for survival and growth at and above 10 ppt salinity.

(ii) Activity: Experiment to evaluate survival and growth of giant freshwater prawn (*Macrobrachium rosenbergii*) juveniles in poly house covered ponds.

Since the prawn juveniles do not survive in open ponds during winter season in the northwestern parts of the country, 3500 number 45-days old juveniles of giant freshwater prawn (*Macrobrachium rosenbergii*) were stocked in an earthen pond of 450 m<sup>2</sup>, covered with a poly house during November 2007. The juveniles were reared in 3ppt salinity water and fed two times with commercial prawn diet. The water of the pond was partly changed after every month. The prawns were harvested on 20 March 2008 by draining the pond. A total of 3140 prawn juveniles of size range 5-15gm, with an average weight 12.0gm were harvested. Thus the experiment has indicated that prawn juveniles could be reared with high survival during winter season in pond covered with poly house.

iii) Activity: Experiment to evaluate survival and growth of giant freshwater prawn (*Macrobrachium rosenbergii*) brood stock in poly house covered ponds.

Since the prawns do not survive in open ponds during winter season in the northwestern parts of the country, 180 number brooders of giant freshwater prawn (*Macrobrachium rosenbergii*) of weight 25-35gm were stocked in an earthen pond of 450m<sup>2</sup> covered with a poly house during November 2007. The brooders were reared in 3ppt salinity water and fed two times with commercial prawn diet. The water of the pond was partly changed after every month. The prawns were harvested on 10 April 2008 by draining the pond. A total of 164 (91 %) prawn brooders of size range female 60-100 gm and male 100-150gm were harvested. Thus the experiment has indicated that prawn brooders could be reared with high survival during winter season in pond covered with poly house.

**11. Project Title: Development and use of specific fluorescent transgenic biosensors for monitoring aquatic heavy metal toxicity**

**Funding Agency:** DBT, New Delhi

**Personnel:** A. Chaudhari, S. Sivasubbu, S. G. S. Zaidi

**Achievements**

The project commenced on Nov 2007 and is expected to generate four transgenic zebrafish bioreporters. The first would be designed to respond to toxic levels of genotoxic agents; the second would be a broad spectrum heavy metal detector (Hg, Cu, Cd and Zn), third and fourth would be for specifically sensing Zn/Cd, and Cu, respectively. The responsive inducible promoters (growth arrest & DNA damage and Metallothionin promoters) have been amplified from Zebrafish, Mouse and a Mollusc, and cloned so as to express green or red fluorescent protein in the presence of toxic levels of relevant pollutants. These constructs are being tested in cell lines and in transient assays in Zebrafish embryos. It is expected that these fishes would be a simple means of monitoring relevant pollutants in the environment. A re-circulatory transgenic fish rearing facility funded by the Institute and DBT is also being set-up for this work.

**12. Project Title: Genetic improvement of *Penaeus monodon* through selective breeding for growth and white spot disease resistance.**

**Funding Agency:** INPIC (International Programme of Institutional Cooperation), Norway

**Participating Institutions:** Central Institute of Brackishwater Aquaculture (CIBA), Chennai, AKVAFORSK, Norway

**Personnel:** Gopal Krishna, S. Jahageerdar, G. Venugopal

### **Achievements**

The third workshop in India and data analysis was carried out at Central Institute of Fisheries Education, Mumbai from October 30 to November 03, 2007. During the workshop, an extensive review and updation of challenge-

test and performance data for the first batch of 51 families were carried out. The data on the harvested shrimp were analyzed for genetic variance. The heritability and approximate genetic correlations were estimated for harvest weight, pond survival and resistance to white spot syndrome virus (WSSV). For harvest-weight, the results demonstrated a highly significant effect of



rearing pond and sex (females being heavier than males), but no effect of rearing location (CIFE or CIBA) and origin of the stocks (Tamil Nadu, Andhra Pradesh and Andamans). The origin of the stocks also did not significantly affect the pond survival. For this trait, the data structure did not allow for fitting these fixed effects. The results showed significant genetic variation in body weight at harvest ( $h^2 = 0.28 \pm 0.07$ ) and general pond survival ( $h^2 = 0.30 \pm 0.06$ ). Approximate genetic correlations indicated a slight positive association between harvest weight and pond survival ( $r_g = +0.16$ ). The estimated heritability for resistance to WSSV was low (0.01). A negative genetic correlation was observed between body-weight at harvest and resistance to WSSV recorded in the controlled challenge-test ( $r_g = -0.20$ ). Although, the analysis did not reveal significant additive genetic variation for resistance to WSSV, a cluster of three families (two from Andhra Pradesh and one from Tamil Nadu) appeared to have relatively higher resistance to WSSV.

### **13. Project Title: Improvement of economic traits in Rohu by diallel crossing of inbred lines**

**Funding Agency:** ICAR ( Agricultural Produce Cess Fund ), New Delhi

**Personnel:** S. Jahageerdar

### **Achievements**

During the ensuing period, brood stock from three hatcheries were collected. A partial diallele mating design was adopted and a total of 33 full-sib families were produced. A total of 728 animals were PIT tagged and are being reared in 3 ponds.

**14. Project title: Potential drugs from selected marine invertebrates and plants from Indian waters.**

**Funding Agency:** Ministry of Earth Sciences, New Delhi

**Personnel:** K. Venkateshvaran, G. Deshmukhe

### **Achievements**

Project initiated in January 2008 and marine floral and faunal samples have been collected and processed as per the protocol given by Central Drug Research Institute (CDRI), Lucknow.

**15. Project Title: Predictive modelling of Bombay duck landings off north-west coast of India**

**Funding Agency:** Ministry of Earth Sciences, New Delhi

**Personnel:** R. S. Biradar, S. Jahageerdar

### **Achievements**

Exponential smoothing models outperformed ARIMA models for annual and also quarterly landings based on  $R^2$ , normalized BIC and RMSE values for Maharashtra and Gujarat. However, for northwest, ARIMA models performed better than exponential smoothing models when fitted for annual landings, while the latter outperformed the former in the case of quarterly landings. Seasonal models fitted for quarterly landings had higher predictive ability as compared to non-seasonal models fitted to annual landings. All the models used in the present study fitted to time series of Bombay duck landings of Maharashtra had relatively lower predictive ability. Markov Chain analysis indicated that the long term projection of Bombay duck landings will stabilize around 45,000 tonnes and 63,000 tonnes for Maharashtra and Gujarat, respectively by 2012.

**16. Project Title: Livelihood and nutritional security of tribal dominated areas through integrated farming systems and technology model**



**Funding Agency:** ICAR (NAIP), New Delhi

**Personnel:** R. S. Biradar, V. K. Tiwari, A. K. Reddy, S. Salim, M. L. Ojha

### **Achievements**

The project commenced in October, 2007. Field survey of 16 water bodies in Banswada district of Rajasthan was carried out for assessing their suitability for undertaking aquaculture activities. Market survey of fish consumption pattern in Banswada indicated that, 41% of respondents reported consumption of fish once in a week, 11% once in a fortnight and 48% once in a month. The consumer preference is more for Catla followed by Rohu and freshwater Eel. The main reason for not eating fish was found to be the high price of fish, non-availability of fresh fish and religious sentiments. Only 7% of the respondents were aware of value-added fish products and none of them had even tasted these products.

Feasibility survey of ornamental fish culture conducted in Banswada, indicated that 54% of the sample respondents were aware of ornamental fish keeping and only about 11% of them had the hobby of ornamental fish keeping. Gold fish was the most preferred aquarium fish.

### **17. Project Title: Exploring market opportunities for fisheries sector in India (Jan-Dec 2008)**

**Funding Agency:** NFDB (National Fisheries Development Board ), Hyderabad

**Personnel:** S. Salim, P. S. Ananthan

### **Achievements**

The country wide project is a sponsored project by NFDB, Hyderabad, and National Centre for Agricultural Economics and Policy Research (NCAP), New Delhi is the lead centre. CIFE as a partner institution would be responsible for conducting the study in Maharashtra and Gujarat with the objectives to diagnose existing marketing structures, to assess their performance in marine and inland sectors, and to undertake successful case studies on innovative marketing arrangements in fisheries sector to assess their feasibility and benefits to fisher folks. The inception workshop was held in February 2008, wherein the work plan and



methodologies were finalized. The study of fish markets, marketing policies, detailed study of Mumbai whole sale and retail fish markets, Veraval market etc have already been studied and the draft report was sent. Identification of innovative marketing models, study of marketing infrastructure and requirements, and study of Nagpur and Surat markets are to be carried out.

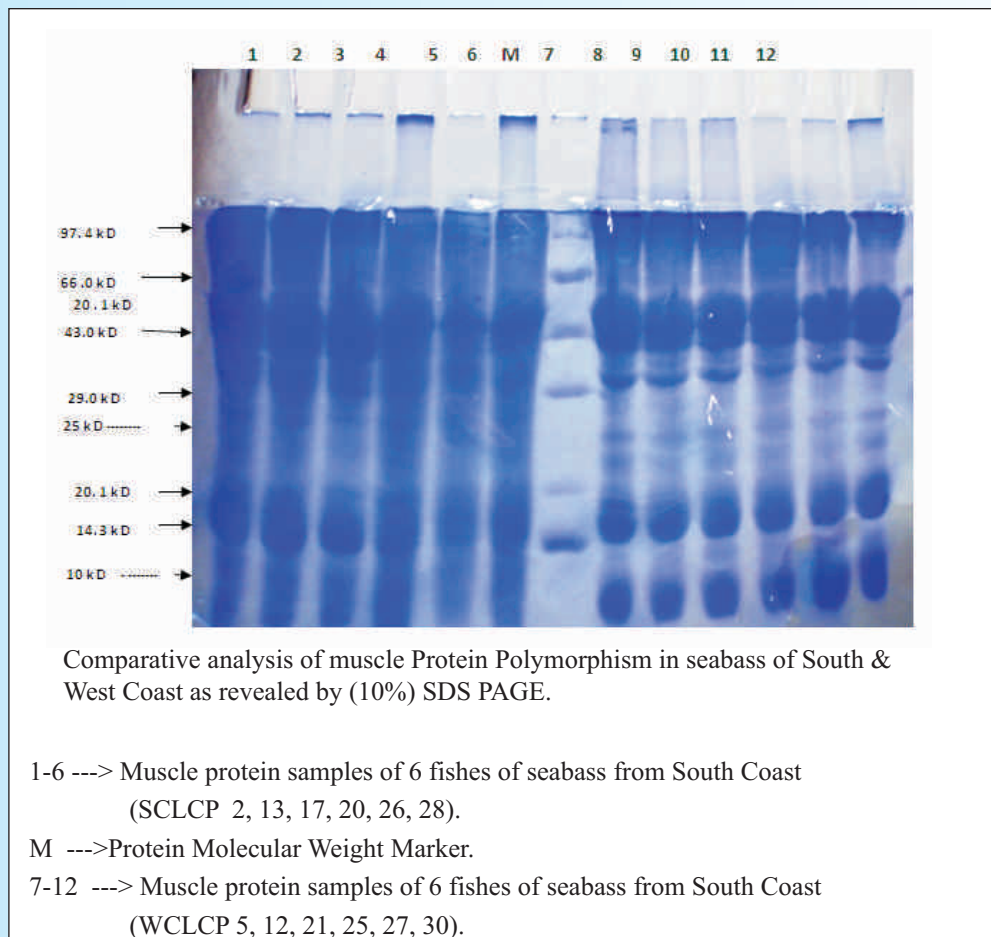
**18. Project Title: Studies on the development of DNA and biochemical markers of seabass, *Lates calcarifer* (Bloch.) from Indian Waters.**

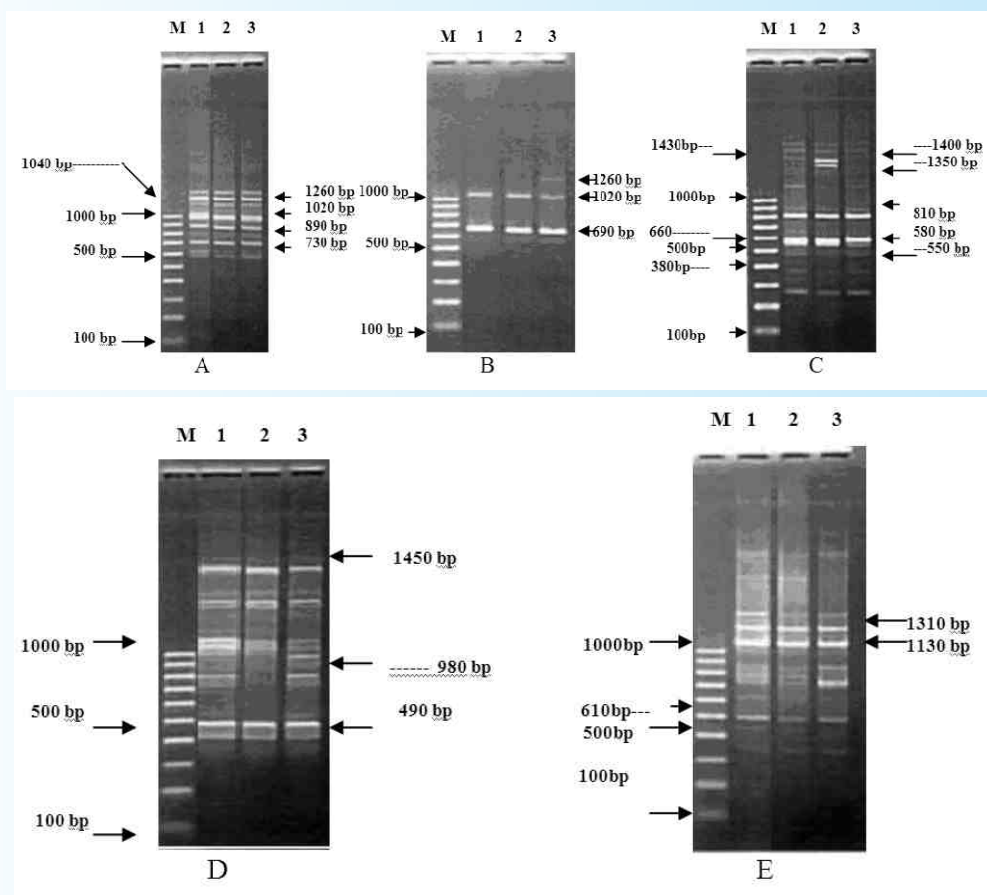
**Funding Agency: ICAR (A P Cess Fund), New Delhi**

**Personnel: S. D. Singh, R. K. Singh**

### **Achievements**

Comparatively many protein bands (below 8 kD) were found in muscles of seabass from South Coast. Further number of protein bands between 14 kD to 20 kD was also higher in muscles of seabass from South Coast in comparison to those of West Coast. Therefore, it is concluded that the muscles protein polymorphism is higher in fish of South Coast than that of West Coast and two unique bands of about 10 and 25 kD seem to be present only in fishes of South coast. This would be further substantiated in comparison to seabass of both West and East Coasts.





Comparative RAPD profiles of *Lates calcarifer* collected from five different sites using different primers (A-OPC-02; B-OPC-07; C-OPC-08; D-OPC-09; E-OPC-11)

- Lane M** : 100 bp DNA molecular weight marker.
- Lane 1** : RAPD profile of sea bass from East Coast.
- Lane 2** : RAPD profile of sea bass from South Coast.
- Lane 3** : RAPD profile of sea bass from West Coast.

Electrophoresis on Agarose gel and Ethidium Bromide staining was usually found sufficient for detection of RAPD-PCR products. The RAPD banding profiles (size in bp) were analyzed in PC using Lab work software UVI soft and amplified bands were determined by comparing with known DNA standard molecular weight marker (100 bp of DNA ladder) in the gel. The reported molecular size of DNA bands after software analysis varied in the range of (+/-) 5 to 10 bp.

All above RAPD primers have shown DNA polymorphism in different coastal stocks of seabass. Primer OPC-08 has given very good results in terms of producing highest number of DNA bands (polymorphic as well as monomorphic) in comparison to other random primers. Maximum numbers of monomorphic DNA bands were obtained with primer OPC-02 as well as OPC-08. East Coast has shown polymorphic DNA banding profile in the range of 380 to 1430 bp, South Coast has shown polymorphic DNA banding profile in the range of 1350 to 1400 bp while West Coast has shown polymorphic DNA in the range of 550 to 1260 bp. In conclusion, the above given polymorphic DNA bands, may come out as DNA markers for a particular coastal region which may be useful for the selection of superior germplasm after further characterization.

### **19. Project Title: Electron radiations from microtron for enhancement of shelf life and nutritional quality of Aqua-feed**

**Funding Agency:** Board of Research in Nuclear Sciences (BRNS), Department of Atomic Energy (DAE), Government of India.

**Personnel:** A. K. Pal, N. P. Sahu, S. Ganesh

#### **Achievements**

Three commonly used aqua-feed ingredients like cotton seed cake, rubber seed cake and soybean meal were exposed to either 0(control), 5, 10, 15, 50 kGy of electron radiation from Microtron. The anti-nutritional factors studied were phytic acid, tannin and hydrocyanic acid. The effect of electron radiation on total free amino acids was also studied.

The result revealed that electron radiation significantly ( $P < 0.08$ ) reduced the levels of phytic acid, hydrocyanic acid content in all the three ingredients. A negative correlation was found between dose of electron irradiation (kGy) in the hydrocyanic acid content of rubber seed cake ( $y = -0.5078x + 3.80$ ,  $R^2 = 0.96$ ), cotton seed cake ( $Y = -0.3566x + 2.93$ ,  $R^2 = 0.94$ ), and soybean meal ( $Y = -0.3252x + 3.09$ ,  $R^2 = 0.69$ ). Similarly, phytic acid content was also followed a negative correlation with electron irradiated rubber seed cake ( $Y = -76.89x + 445.71$ ,  $R^2 = 0.80$ ), cotton seed cake ( $Y = -44.413x + 398.83$ ,  $R^2 = 0.99$ ) and soybean meal ( $Y = -203.27x + 1111$ ,  $R^2 = 0.95$ ). No defined trend was found for tannin and total free amino acid of the ingredients. At 10 kGy level of irradiation the percentage reduction of hydrocyanic acid, Phytic acid and tannin was 34, 63, 22, respectively. However when total reduction (%) of hydrocyanic acid, phytic acid and tannin were pooled together an optimum level of 9.33 kGy found to reduce all the anti-nutritional factors to the maximum level.

### **20. Project Title: Potential uses of thermal effluents of nuclear power plants for carp breeding and seed production**

**Funding Agency:** Board of Research in Nuclear Sciences (BRNS), Department of Atomic Energy (DAE), Government of India

**Personnel:** A. K. Pal, S. C. Mukherjee, M. H. Chandrakant, S. K. Apte

#### **Achievements**

CIFE in collaboration with BARC-BRNS-DAE and KGS has established a fish hatchery at Kaiga Nuclear Power Plant, Kaiga (Karnataka) for efficient



utilization of nuclear power plant discharge in aquaculture. The concept of engineering interventions has been applied for maintaining optimum temperature round the year at hatchery complex for fish breeding and seed rearing. The results indicate that maintaining optimum temperature decreases incubation period and increases growth of fry & fingerlings of Indian Major Carps. This was a successful fish breeding programme carried out in warm water effluents from nuclear power plant in India. However, some constraints were identified and recorded through this projects especially parasitic infection in brood fishes as well as in spawn.



Combined effect of temperature and chlorine on the fry of *Labeo rohita*

A laboratory experiment is being conducted to see the effect of acclimation temperature and chlorine (0.1 ppm) at different acclimation temperatures (26, 31, 33 and 36 °C) in *Labeo rohita* (Mean  $\pm$  SE: 3.3  $\pm$  0.2 g). A constant level of (0.1 ppm) chlorine was maintained throughout the experimental phase. Data on enzyme activity in different tissues of *rohita* exposed to different temperatures in combination with 0.1 ppm chlorine showed variation with increasing temperatures at 20 days and were significantly different ( $p < 0.05$ ) amongst the experimental groups. After 28 days acclimation, values were significantly different than that of 14 days ( $p < 0.05$ ) and varied with increasing acclimation temperatures. LDH activity increased with increasing acclimation temperatures to cope up with the increasing metabolic activity (as evident from oxygen consumption rate). However, LDH activity got inhibited due to free chlorine in rearing waters. LDH activity appears to stabilize after 28 days as compared to that of 14 days acclimation trial. MDH activity increased with

increasing acclimation temperatures and evidence of stress associated with temperature. ALT and AST activity in liver was inhibited with increasing acclimation temperatures in presence of chlorine, which might be due to the inhibition of *de novo* synthesis of protein. Similar pattern of inhibition of transaminase enzymes in the liver with chlorine treatments was observed during the first 14 days of the acclimation phase. ATPase activity increased significantly with increasing acclimation temperatures, which indicates that there was no depletion of ATP between temperature ranges from 26 to 36 °C. Presence of free chlorine (0.1 mg. l<sup>-1</sup>) increased ATPase activity after 14 days acclimation, however stabilized after 28 days acclimation. ALP activity in all the organs tested (intestine, liver and muscle) increased significantly with increasing acclimation temperatures. However, the presence of chlorine in rearing waters inhibited ALP activity in all the organs tested. In the present study, significant inhibition of AChE activity was observed in brain tissue of *L. rohita* at higher acclimation temperatures and in chlorine treated groups.

**21. Project Title: ICAR Mega Seed Project - seed production in agricultural crops and fisheries**

**Personnel:** M. P. S Kohli, S. Raizada

**Funding Agency:** ICAR, New Delhi

**Achievements**

The mega seed project, funded by ICAR commenced in November, 2007 and the necessary infrastructure have been developed. Rearing of fry in cages and natural ponds were carried out to develop natural colouration and pigmentation. Experiment trials on artificial feeds are in progress for different species for improving the growth and maturity. Brooder management is also being carried out. Live-feed culture facilities were set up to feed different species in addition to artificial feeds.

Production and sale of quality prawn seed using ground saline water

Produced 1.90 lakh prawn seed and supplied to the state fisheries departments, ICAR institutes and then to farmers in the reporting period.

**22. Project Title: Education Division supported experiential learning project**

**Funding Agency:** ICAR, New Delhi

**Personnel:** S. Basu, B. B. Nayak

### **Achievements**

The development of facilities for training and experiential learning was achieved. Development of a sales counter, a modular kitchen and renovation of existing facilities were achieved. A walk-in cold room and a can seaming machine were added to the existing facilities.

### **23. Project Title: Studies on germ plasm preservation of marine algae**

**Funding Agency:** Department of Ocean Development, New Delhi

**Personnel:** G. Deshmukhe

### **Achievements**

The survival rate of the cryopreserved thalli of three economically important algal species has been tried in the tank culture up to 70 days. Three cryoprotectants were used and glycerol was found to be best among them. *Gracilaria* showed maximum survival rate (70%) followed by *Ulva* and the least survival by *Hypnea*.

### **4.3. Contract Research Project**

#### **1. Project Title: Bio-safety Study of Bt Cotton with Cry 1 Ac gene on Common Carp (*Cyprinus carpio*)**

**Name of Sponser:** Central Institute for Cotton Research, Nagpur.

**Personnel:** K. K. Jain, N. P. Sahu

### **Achievements**

Procured fish seed of Common carp (*Cyprinus carpio*) for the experiment purpose from Fish Seed Farm, Khopoli, District Raigad. Prepared the different experimental diets with different doses @ 0%, 10%, 20% and 30% of Bt and non-Bt cotton. Set up the experiment at CIFE wet laboratory and stocked the seed as per experimental design. A 60 days feeding trial was conducted on Common carp fry to study the biosafety effect of Bt. cotton seed cake with Cry 1 Ac gene supplied by CICR, Nagpur. Bt Cotton seed cake was included in the diet of common carp at three levels and compared with its non-Bt. cotton counterpart along with a control group (Non cotton seed cake). Growth rate of Bt cotton seed cake was equally comparable ( $P > 0.05$ ) with that of control group and Non-Bt counterpart as well. No mortality was found during the experimental period, suggesting no adverse effect due to feeding of Bt Cotton seed cake in *C. carpio*. The duration of this project was six months from

January 15, 2007 to July 15, 2007 and the final report has been submitted to the CICR, Nagpur.

## **2. Project Title: Developing fisheries policy and development strategies for Bihar**

**Funding Agency:** Government of Bihar, Patna

**Personnel:** Dilip Kumar, P. S. Ananthan, R. S. Biradar, R. P. Raman, B. B. Nayak

### **Achievements**

It is a consultancy project given by Department of Fisheries, Govt. of Bihar. An Action Plan for fisheries and aquaculture development in Bihar has been developed based on inputs from the participatory review workshop organised at Patna with State Department of Fisheries, Bihar as well as the field study and stakeholder inputs. Inputs for preparation of Draft Fisheries Policy of Bihar were provided. Later the draft prepared by the Directorate of Fisheries was thoroughly revised and rewritten incorporating many essential elements for attaining the vision of making the Fisheries Department a knowledge driven development organization with dynamic, motivated and professional human resources that delivers quality extension services, co-manages resources with stakeholders, guides sustainable and equitable development, and is modern, accessible and accountable. The revised policy has been accepted in principle by Government of Bihar and will soon be implemented.



## 6. Extension Achievements

### 6.1 Short term Training Programmes (STP)/ Special Training Programmes

Title	Venue	Duration	No. of participants
Application of molecular biological tools and techniques in fish	Mumbai	February 15 to June 15, 2007	01
Fish & Prawn Culture ( X batch of Bihar Fish Farmers)	Kakinada	April 09-18, 2007	40
Different aspects of Aquaculture	Kolkata	April 27-30, 2007	20
Value added fish products	Mumbai	May 08-10, 2007	20
Fish & Prawn Culture ( XI batch of Bihar Fish Farmers)	Kakinada	May 10-19, 2007	40
Molecular cloning and expression VP19 and VP28 genes of WSSV of shrimps	Mumbai	May 10 to July 09, 2007	01
Production of Hyper-immune sera against WSSV	Mumbai	May 10 to July 09, 2007	01
Ornamental fish culture (I-Batch of Special Training Programme for women of West Champaran, Bettiah, Bihar	Kolkata	May 22 to June 05, 2007	20
Parasitic Diseases of fishes	Mumbai	May 23 to June 23, 2007	01
Advancement in fisheries and aquaculture	Mumbai	June 04-08, 2007	09
Fish & Prawn Culture ( XII batch of Bihar Fish Farmers)	Kakinada	June 08-17, 2007	39
Hatchery management of Giant Freshwater Prawn for trainees from CIFE, Powarkheda.	Rohtak	July 16 --28, 2007	02
Capsule course on Fish & Fisheries for the Jammu & Kashmir trainees	Rohtak	July 01 to December 31, 2007	13
Regular course of J & K trainees.	Powarkheda	July 11 to August 10, 2007	14
Fresh water fish and prawn culture	Powarkheda	July 17-31, 2007	20
Fish & Prawn Culture ( XIII batch of Bihar Fish Farmers)	Kakinada	July 22-31, 2007	34
Field Training in Freshwater and Brackish water Farming (M.F.Sc. students of CIFE, Mumbai)	Kakinada	July 24 to September 05, 2007	22
Seed production and culture of Giant Fresh water Prawn	Rohtak	July 24-30, 2007	02
Fish & Prawn Culture ( XIV batch of Bihar Fish Farmers)	Kakinada	August 04-13, 2007	40

Fish and Prawn Culture (for PACT-NGO, Lucknow, U.P.)	Pratapgarh	August 09-11, 2007	27
Fish & Prawn Culture ( XV batch of Bihar Fish Farmers)	Kakinada	August 23 to September 01, 2007	40
Fresh Water Fish and Prawn Culture (Fish Farmers of West Champaran, Bettiah, Bihar)	Powarkheda	August 23 to September 05, 2007	20
Ornamental Fish Breeding and Culture (II-Batch of Special Training Programme for women of West Champaran, Bettiah, Bihar)	Kolkata	August 31 to September 14, 2007	20
Breeding & Culture of Carps and Magur For Bihar Fish Farmers (I-Batch of FFDA, Rohtas, Bihar)	Kakinada	September 03-12, 2007	25
Management of Freshwater Fish Farm (For M.F.Sc. Students from Dept. of Applied Aquaculture Barkattulah University, Bhopal)	Powarkheda	September 10-19, 2007	21
Fin Fish and Shell Fish Farming (B.Sc. Industrial Fisheries, Bihar)	Kakinada	September 11-25, 2007	23
Fish& Prawn Culture (XVI batch of Bihar Fish Farmers)	Kakinada	September 20-29, 2007	40
Freshwater Fish & Prawn Culture (For Bihar Fish Farmers from West Champaran District)	Powarkheda	September 25 to October 08, 2007	20
Breeding & Culture of Carps and Magur For Bihar Fish Farmers (II-Batch of FFDA, Rohtas, Bihar)	Kakinada	October 03-12 2007	25
Brackish water Fish & Shell Fish Farming (I -batch of M.Sc. (Zoology) students of Adikavi Nannaya University, Rajahmundry)	Kakinada	November 16-24, 2007	28
Fish & Prawn Culture ( XVII batch of Bihar Fish Farmers)	Kakinada	November 29 to December 8, 2007	40
Ornamental Fish Breeding and Culture (III-Batch of Special Training Programme for women of West Champaran, Bihar)	Kolkata	November 30 to December 14, 2007	20
Fish Culture (Farmers of M.P. Rural Livelihood Project, Dhar, M.P.)	Powarkheda	December 10-15, 2007	20
Fish & Prawn Culture (I-Batch of FFDA Fish Farmers, Patna, Bihar)	Kakinada	December 10-19, 2007	40

Fish Feed Formulation and Processing Technology (Govt officials of Mizoram)	Kolkata	December 11-15, 2007	14
Fisheries, Aquaculture and Processing of Fish of Inland Waters (students of B.Sc.(Industrial Fish and Fisheries) SNS College, Motihari, Bihar)	Kolkata	December 22, 2007 to January 1, 2008	7
Fish & Prawn Culture ( XVIII batch of Bihar Fish Farmers)	Kakinada	December 29, 2007 to January 7, 2008	39
Fish Culture ( Farmers of M.P. Rural Livelihood Project, Dindori, M.P.)	Powarkheda	January 07-12, 2008	22
Fish & Prawn Culture (II-Batch of FFDA Fish Farmers, Patna, Bihar)	Kakinada	January 17-26, 2008	39
Integrated Fish Farming and Composite Fish Culture ( Fisheries Officers of Assam)	Kolkata	January 20-26, 2008	18
Freshwater fish and prawn culture ( Farmers of MP)	Powarkheda	January 17-31, 2008	20
Fish & Prawn Culture ( XIX batch of Bihar Fish Farmers)	Kakinada	January 31 to February 9, 2008	38
Integrated Fish Farming and Composite Fish Culture ( Fisheries Officers of Assam)	Kolkata	February 04-10, 2008	18
Fish & Prawn Culture (III-Batch of FFDA Fish Farmers, Patna, Bihar)	Kakinada	February 12 - 21, 2008	40
Freshwater Fish & Prawn Culture.	Powarkheda.	February 14-28, 2008	20
Physio-chemical analysis of water and soil for aquaculture	Kolkata	February 18-24, 2008	01
Integrated Fish Farming and Composite Fish Culture ( Fisheries Officers of Assam)	Kolkata	February 18-24, 2008	18
“Value added fish products” ( St. Xaviers’ College,Goa)	Goa	February 21-23, 2008	25
Value added fish products (M .M. Hall, Mudgaon, Goa)	Goa	February 24-6, 2008	25
Code of Conduct for Responsible Fisheries and Sea safety	Mumbai	February 25-29, 2008	13
A training programme in association with MPEDA, Kolkata was organized on Breeding of ornamental fish for the beneficiaries of West Bengal.	Kolkata	February 26, to March 01, 2008	25

Fish & Prawn Culture ( XX batch of Bihar Fish Farmers)	Kakinada	February 28 to March 8, 2008	40
Integrated Fish Farming and Composite Fish Culture ( Fisheries Officers of Assam)	Kolkata	March 03-09, 2008	23
Breeding of ornamental fish for the beneficiaries of West Bengal	Kolkata	March 04-08, 2008	25
Breeding of ornamental fish	Kolkata	March 01-15, 2008	25
Fish & Prawn Culture (IV-Batch of FFDA Fish Farmers, Patna, Bihar)	Kakinada	March 11-20, 2008	39
Fresh water fish and prawn culture (Fisheries Officers of MP, Rajasthan, UP, and Bihar)	Powarkheda	March 11-18, 2008	12
An exposure visit was organized for farmers/representatives from Fishermen Co-operative Societies and Officials under Agriculture Technology Management Agency, Karimnagar, Andhra Pradesh	Kolkata	March 27 to April 01, 2008	20





## 6.2 Participation in Exhibitions

Event	Venue	Duration
National Hindi Workshop on “Parvatiya Matsiki Paridrushya: Vikas Prabandhan Evam Sarakshan”.	NRC on Coldwater Fisheries, Bhimtal, Nainital	April 06-07, 2007
Fourth Indian Fisheries Science Congress on “Ecology & Fisheries of Wetlands of India” organized by Indian Society of Fisheries Professionals, Mumbai.	ICAR Research Complex for Eastern Region, Patna	April 12-13, 2007
Workshop on “Fisheries and Aquaculture for Sustainable Livelihood Development” jointly organized by CIFE, and NAF, Mumbai	CIFE, Mumbai	August 20, 2007
Regional Workshop on “Food & Agriculture” organized by the CBSE, New Delhi	CBSE, New Delhi	August 24-25, 2007
11 <sup>th</sup> National Expo (Theme: Contribution to our National Progress) organized by Central Calcutta Science and Culture Organization for Youth, Kolkata.	Kolkata	September 07, 2007
Krushak Sangoshthi and Exhibition, on the occasion of Fish Farmers’ Day 2007 at CIFE Centre, Powarkheda	CIFE Centre Powarkheda	September 26, 2007
National Workshop on “Sustainability of Indian Aquaculture Industry” and Sustain-Aqua Exhibition: 2007 IIT, Kharagpur	IIT, Kharagpur	September 28-29, 2007
Scoping workshop: Fisheries Based Eco-Tourism (Organized jointly by IFA and CIFE, Mumbai)	Saguna Baug, Neral, Maharashtra	October 5, 2007
International Symposium on “Management of Coastal Ecosystem : Technological Advancement and Livelihood Security” organized by Indian Society of Coastal Agricultural Research, Canning, W.B.	Science City, Kolkata	October 27-30, 2007
8 <sup>th</sup> Asian Fisheries Forum Symposium - 2007 and International Trade Exhibition	Le Meridien Resort, Kochi	November 20-23, 2007
“Krishi-2007” & International Agricultural Trade Fair and Conference organized by Media Exhibitors, Nashik	Nashik	November 20-December 03, 2007

18 <sup>th</sup> All India Congress of Zoology and National seminar on “Current Issues on Applied Zoology and Environmental Sciences with special reference to Eco-restoration & Management of Bio-resources” jointly organized by University of Lucknow and B.B. Ambedkar University, Lucknow	University of Lucknow, Lucknow	December 07-09, 2007
19 <sup>th</sup> Krishi Shilpa ‘O’ Banijya Mela organized by Agragami Handicapped Samity, W.B. Ratanpur, Purba	Ratanpur, Purba Medinipur, W.B.	December 09 - 15, 2007
National Symposium on “Ecosystem Health and Fish for Tomorrow” and “Matsya Utsav- 2007” jointly organized by CIFRI and Indian Fisheries Society of India, Barrackpore	CIFRI, Barrackpore	December 14 - 16, 2007
Kisan Mela cum exhibiton under ‘Bharat Nirman Abhiyan - 2007-08’	Dewas (M.P.)	December 18-22, 2007
95 <sup>th</sup> Session of Indian Science Congress, Andhra Univ. Visakhapatnam	Andhra Univ. Visakhapatnam	January 03 -07, 2008
Vesava Koli Sea Food Festival - 2008 organized by Vesava Koli Jamat Trust, Mumbai	Versova, Mumbai	January 18 -20, 2008
Koli Sea Food Festival (As part of 4 <sup>th</sup> Mumbai Festival-2008) organized by Koli Festival Sanstha, Versova, Mumbai	Versova, Mumbai	January 24 -27, 2008
BIOCAM-2008 & International Conference on “Biodiversity Conservation and Management” organized by Rajiv Gandhi Chair in Contemporary Studies, Kochi, Cochin Univ. of S&T, Kochi	Cochin Univ. of S&T, Kochi	February 03 - 06, 2008
Pusa Krishi Vigyan Mela 2007, : IARI, Pusa, New Delhi	Pusa, New Delhi	February 21-23, 2008
Science and Technology Fair-2008 organized by Institute of Social Studies, Kolkata	Salt Lake, Kolkata	February 15 - 24, 2008
Krishi Mela and Krushak Sangosthi’ under ‘ATMA’ project	Powarkheda (M.P.)	March 24-25, 2008
Assam Matsya Mahotsav - 2008 organized by DoF, Assam	Guwahati	March 29-31, 2008

## 6.3 Radio Talk delivered

- Shri R. Ravishankar Patnaik, Technical Officer attended an interview programme at All India Radio, Visakhapatnam on the topic “Bangaaruteega Chepalalo Santanopathi Melakuvalu” on July 03, 2007.
- Shri V. Narasimhacharyulu, Technical Officer delivered a talk on “Uppuneeti Cheruvulalo Neeti Nanyata Yajamanyam” at All India Radio, Visakhapatnam, on August 03, 2007.
- Dr. J. Krishna Prasad, Technical Officer attended a radio interview for the farmers on the topic “Inbreeding stress problems being faced by the farmers and industry” at All India Radio, Visakhapatnam, on October 03, 2007.
- Sh. K. Murali Mohan, Technical Officer delivered a talk on “*Uppuneeti chervulo misrama pempakamga palachepalatho kalipi koyyanga chepala pempakam*” at All India Radio, Visakhapatnam during November 12, 2007.

## 6.4 Print media

- An article on “What lies beneath” highlighting the activities of CIFE was published in West Side Plus, Times of India, Mumbai edition dated March 5, 2008.
- The exhibitions organized on the occasions were widely covered by local television and print media in the local news paper like Dainik Bhaskar, Dainik Nai Dunia, Dainik Jagaran etc.

## 6.5 Fish Farmers' Day

### Kakinada Centre

The Fish Farmers' Day was celebrated by Kakinada Centre on July 10, 2007. Two farmers viz., Shri Yalla Krishna Rao from Kajuluru, E.G. District and Shri G.



Eswar Raju from Kaikaluru, W.G. District were felicitated as the Best Fish Farmers. Shri N. Sessa Reddy, M.L.C. (Govt. of Andhra Pradesh) was the Chief Guest. About 200 farmers attended the function and were motivated for sustainable aquaculture. Dr. T. Rajya Lakshmi, Former

Director, CIBA, Chennai and Dr. K.A. Narasimham, Former Principal Scientist, CMFRI, Kochi along with other higher officials from Dept. of Fisheries also graced the function.

### Powarkheda Centre

The Fish Farmers' Day was celebrated by Powarkheda Centre on September 26, 2007. Shri Moti Kashtyap, H'ble State Fisheries Minister, M.P. was the Chief Guest of the programme. Three fish farmers from diffeent parts of India, Shri Sahji Chacko, Bilimora, Distt. Walsad, Gujrat, Shri G. Eswara Raju, Bhyravapatanam, Distt. Krishna, A.P., Shri Kunwar Bisen, Distt. Balaghat, M.P., were awarded as the Best Fish Farmers of the year 2006 -2007.





## 6.6 Visit Coordination:

Date / Period	Organization / University / College / Category of Visitors	No. of Visitors
CIFE, Mumbai		
April 20, 2007	College of Fisheries, Veraval (Gujarat)	19
May 8-11, 2007	DoF, Government of Karnataka	02
May 9-11, 2007	College of Fisheries, Assam	05
June 10-11, 2007	CIFE Centre, Kolkata	22
June 15-16, 2007	College of Fisheries, Mangalore, karnataka	28
July 24, 2007	N.B. Mehta Science College, Thane, Maharashtra	25
August 7, 2007	S.I.W.S. College, Mumbai	20
September 7, 2007	Lords College, Malad(E), Mumbai	40
October 9, 2007	Mahatma Gandhi Institute of Applied Sciences, Jaipur, Rajasthan	35
October 26, 2007	Motilal Jhunjunwala College, Vashi, Navi Mumbai	70
October 30, 2007	Abhinav College, Bhayandar(E), Mumbai	23
December 12,2007	R.K. Talreja College, Mumbai	25
December 20,2007	Bhavans College, Andheri (West), Mumbai	25
December 15-19, 2007	CIFE Centre, Rohtak	13
December 27-31, 2007	College of Fisheries, Dholi, Muzafarpur, Bihar	4
December 31, 2007.	College of Fisheries, Dapoli, Ratnagiri, Maharashtra	14
January 22, 2008	Veer Wajekar College, Mumbai	31
January 30 -February 2, 2008	College of Fisheries, Raha, Assam	15
January 3, 2008	Ramnarain Ruia College, Mumbai	10
January 11, 2008	R.D. National College, Mumbai	25
January 8, 2008	Maharahstra College, Mumbai	40
January 4, 2008	Sathaye College, Mumbai	16
February 20, 2008	B.N.N. College, Bhiwandi, Thane, Maharashtra	35
February 19-20, 2008	CAS in Marine Biology and Oceanography, Annamalai University, Tamil Nadu	31

CIFE, Powarkheda Centre		
July 5-9, 2007	Women of Self Help Group of Integrated Wetland Development Programme	110
July 13-14, 2007	Govt. Holkar Science College, Indore.	27
September 29,2007	Shri Satya Sai College for Women, Bhopal.	41
November 29, 2007	Govt. Degree College, Harda	30
December 11,2007.	Career College, Bhopal.	10
December 12,2007	Central School, Hoshangabad.	75
January 28, 2008.	Farmers from Distt. Raisen	35
February 16, 2008	District Officials of M.P. Fisheries Dept. under M.P.W.S.R. project from Dept. of Applied Aquaculture, B.U. Bhopal.	15
CIFE, Kakinada Centre		
June 08, 2007	CIFE Kolkata Centre	22
August 25, 2007	Acharya Nagarjuna University	40
September17,2007	V.S. Laxmi College, Kakinada	29
September28,2007	A.C.College, Guntur	20
November23, 2007	Women College, Guntur	80
February 13,2008	NFDB trainees	31
February 21,2008	Netaji Public School, Bikkavolu	40
February 21,2008	Govt. College, Rajahmundry	38
February 28,2008	Akivedu Aqua Farmers	03
February 28,2008	S.K.R. College, Rajahmundry	20
March 01,2008	Farmers from ATMA	40
March 10-11, 2008	Vivekavardhani College, Hyderabad	25
March 18-19, 2008	Andhra University, Visakhapatnam	20
CIFE, Rohtak Centre		
March 23, 2008	Farmers of District Baghpat, Uttar Pradesh	19

## 6.7 Transfer of Technology and Demonstration

The Department of Fisheries, Haryana was accorded technical know-how on prawn farming by Rohtak Centre during the reported period. A total of eight pond sites both at state farms and at private farms were selected for the purpose. Culture of prawn under both monoculture and polyculture systems were demonstrated. Demonstration of Carp culture practices were given to RDFs in their tanks in four blocks of Dist Hoshangabad by Powerkheda centre.

CIFE, Kakinada Centre coordinated the Field Experience Training (FET) for 6 ARS probationers of 82<sup>nd</sup> Foundation Course for Agricultural Research Service (FOCARS) from National Academy of Agricultural Research Management (NAARM), Hyderabad from March 18,2008 - April 05,2008.

### North Eastern Region

Innovative aquaculture extension strategy and approaches were demonstrated in North-Eastern states by Dr. A. K. Reddy, Sr. Scientist and Dr. V. K. Tiwari, Sr. Scientist, under the guidance of Dr. Dilip Kumar, Director,CIFE. Result demonstration programmes were undertaken in Tripura on Semi-intensive Carp Culture (5 units); Polyculture of Carps and Giant Freshwater Prawn (5 units); Monoculture of Prawn (2 units); Manure-based Low Cost Carp Culture (3 units) and House-hold Fish-cum-Pig Integrated Farming (3 units). Result demonstration in Manipur included Polyculture of Carps (24 units); Manure-based Low Cost Carp Culture (24 units); House-hold Fish-cum-Pig Integrated Farming (4 units) and Fisheries Co-management in two units of 100 ha and 50 ha at Sendra Village and Takmu Village respectively in Bishnupur District.



In **Mizoram**, demonstration programmes were conducted on Polyculture of Carps (5 units); Polyculture of Carps and Prawn (5 units); Manure-based Low Cost Carp Culture (5 units); House-hold Fish-cum-Pig Integrated Farming (5 units) and House-hold Fish-cum-Poultry Integrated Farming (5 units).

Trickle Down System (TDS) of aquaculture extension was introduced in 250 blocks. A total of 11 training programmes were organized at block level to impart TDS of aquaculture extension to the officials of DoF, **Assam**. Co-management approach was also introduced in 4 ox-bow lakes. Accordingly the officials of Assam Fisheries Development Corporation were trained. These programmes were organized during May 21, 2007 to June 3, 2007 and January 28, 2008 to February 16, 2008.

A giant freshwater prawn hatchery was established in **Nagaland** at Natanglu Fish Farm and operated successfully. Broodstock was supplied from CIFE, Mumbai. A two day workshop on 'Giant Freshwater Prawn Culture' was organized at Dimapur, during February 08-09, 2008.





## Farmers' Meets/Training programmes organized in the NE states

Name of programme	Period	State
Training programme to the RDFs and FFs on Aquaculture Technologies.	July 09-12, 2007	Manipur
Farmers meet for selection of result demonstration farmers for various demonstration programmes” at Oinam village, Bishnupur District.	April 24, 2007	Manipur
A day long programme for the members of All Manipur Women Association (Reg. No. 1789) was organized to discuss various demonstration programmes to be undertaken at Mayang Imphal, Imphal West District.	April 25, 2007	Manipur
Farmers meet for selection of result demonstration farmers for various demonstration programmes at Wabgai village, Thoubal District.	April 23, 2007	Manipur
PRA for the “Assessment of fisheries development of 1 <sup>st</sup> unit of 100 ha. segment of Loktak Lake” at Sendra village, Bishnupur District.	July 08, 2007	Manipur
PRA for the “Development of 2 <sup>nd</sup> unit of 45 ha. of Loktak Lake segment through Fisheries Co-management” to the fishers of Khoiron Leikai and Kola villages at Kola, Bishnupur District.	July 07, 2007	Manipur
Training programme on “Trickle Down System (TDS) of Aquaculture Extension” to the Regional Officers of Department of Fisheries, Government of Assam, at Nagaon, Assam.	June 01-03, 2007	Assam
“Training programme to the Result Demonstration Farmers (RDFs) and Fellow Farmers (FFs) on Aquaculture Technologies”	June 01-03, 2007	Mizoram
Training programme to the RDFs and FFs on Aquaculture Technologies.	June 16-18, 2007	Tripura
PRA programme on “Fisheries Co-management” to the Fishers of Sendra village, Bishnupur District.	May 19, 2007	Manipur
Training programme on “Trickle Down System (TDS) of Aquaculture Extension” to the Regional Officers of Department of Fisheries, Government of Assam, at Guwahati, Assam.	May 21-23, 2007	Assam
Training programme on “Trickle Down System (TDS) of Aquaculture Extension” to the Regional Officers of Department of Fisheries, Government of Assam, at Barpeta, Assam.	May 25-27, 2007	Assam
Training programme on “Trickle Down System (TDS) of Aquaculture Extension” to the Regional Officers of Department of Fisheries, Government of Assam, at Dhulri, Assam.	May 29-31, 2007	Assam

Training programme on “Trickle Down System (TDS) of Aquaculture Extension” for the Officers of Department of Fisheries, Government of Mizoram at Aizawl.	May 29-31, 2007	Mizoram
PRA on “Fisheries co-management in Loktak Lake” for the fishers of 1 <sup>st</sup> and 2 <sup>nd</sup> units.	November 01, 2007	Manipur
Training programme to the RDFs and FFs on various result demonstrations programme undertaken in Manipur.	November 02-04, 2007	Manipur
Training programme to the RDFs and FFs on Aquaculture Technologies undertaken in Tripura at Ambassa, Dhalai District	November 05-11, 2007	Tripura
Training programme to the RDFs and FFs on Aquaculture Technologies undertaken in Tripura at Matabari, Udaipur block, South Tripura District.	November 06-07, 2007	Tripura
STP on fish feed formulation and processing technologies for Departmental Officers of Fisheries, Govt. of Mizoram.	December 11-15, 2007	Mizoram
STP on “Integrated fish farming and composite fish culture” for Departmental officers in the rank of AFO/FD of Dept. of Fisheries, Govt. of Assam.	January 20-26, 2008	Assam
Training programme on “Freshwater Aquaculture” to the members of Rangapara Development Circle, Rangapara, Tezpur District.	January 28 to February 06, 2008	Assam
Training programme on “Integrated fish farming and composite fish culture” for the officers of DoF, Assam	February 04-10, 2008	CIFE Kolkata Centre
Training programme on “Integrated fish farming and composite fish culture” for the officers of DoF, Assam	February 18-24, 2008	CIFE Kolkata Centre
Training programme on “Integrated fish farming and composite fish culture” for the officers of DoF, Assam	February 03-09, 2008	CIFE Kolkata Centre
Training programme on ‘Trickle Down System (TDS) of aquaculture’ for the officers of DoF Assam	February 02-04, 2008.	Lakhimpur, Assam
Training programme on ‘Trickle Down System (TDS) of aquaculture’ for the officers of DoF Assam	February 05-07, 2008	Jorhat, Assam
Training programme on ‘Trickle Down System (TDS) of aquaculture’ for the officers of DoF Assam	February 14-16, 2008	Silchar, Assam
Training programme on ‘ Fisheries co-management’ to the officers of Assam Fisheries Development corporation	February, 07, 2008	Jorhat, Assam
Training programme on ‘ Fisheries co-management’ to the officers of Assam Fisheries Development corporation	February 11-13, 2008	Guwahati, Assam

Training programme on ' Fisheries co-management' for the officers of Assam Fisheries Development corporation	February 11-13, 2008.	Rampur, Assam
Training programme on ' Fisheries co-management' for the officers of Assam Fisheries Development corporation	February 04-16, 2008.	Silchar, Assam
Training programme on ' Freshwater aquaculture' for the RDFs and FFS	February 24-26, 2008	Kolasib, Mizoram
Review workshop on fisheries and aquaculture development in Mezoram	February 27-28, 2008	Aizawal, Mizoram
PRA on fisheries co-management at Loktak lake	February 20, 2008	Moirang, Manipur
Training programme to the RDFS	February 21-22, 2008	Imphal, Manipur

### Other programmes in NE states.

Programme	Resource person/persons attended
Training programme to KVK officials of Zone - III, ICAR complex for NEH Region organized by CIFRI Regional Centre for NE Region, Guwahati on July 3-7 2007.	Dr. Archana Sinha Dr. A.K. Reddy
Training programme on "Operation of feed mill and feed formulation organized by DoF, Mizoram.	Dr. P. Sardar
Workshop on "Fisheries Conservation and Enhancement: Linking Researchers and Stakeholders" organized by NBFGR, Lucknow at Guwahati during December 18-19, 2007.	Dr. Gopala Krishna Dr. A.K. Reddy
Assam Matsya Mahotsav, 2008 to be organized by DoF, Assam at Shilpgram, Guwahati during March 29-31, 2008.	Dr. Dilip Kumar Dr. A.K. Reddy Dr. P.K. Roy

## 6.8 Extension Activities

Conducted “Dimbhe Reservoir Fisherfolk Meet” on the importance of fisheries in the livelihood development of *Katkari Tribals* during 30<sup>th</sup> January to 1<sup>st</sup> February 2008. To program included Field visits: Rearing Pond , Solar dryer, cage culture, Katkari village and fishing etc. An interaction with Dimbhe fisher folk, followed by lectures on fisheries in small ponds, sustainable fish culture and reservoir fisheries by CIFE staff and aquarium fish demonstration and awareness programme specially organized for fisherwomen.

## 6.9 Cruise programmes organised

20 cruises consisting of training and research were conducted during the year 2007-08 on board vessels MFV Saraswati and MFV Narmada

Participants	Duration	Period
MFV Saraswati		
B.F.Sc. students, College of Fisheries, Tripura	3 days	March 06-08, 2008.
M.F.Sc. student, CIFE	5 days	March 19-23, 2008
MFV Narmada		
M.F.Sc. student, CIFE	1 day	October 24, 2007
M.F.Sc student, CIFE	1 day	November 01, 2007
PhD. student, CIFE	1 day	December 11, 2007



## 7. Honours & Awards

CIFE (Powarkheda Centre) stall won the consolation prize in the Kisan Mela cum exhibition under 'Bharat Nirman Abhiyan - 2007-08' held on December 18-22, 2007 at Dewas (M. P.) organized by Press Information Bureau, Govt. of India, Indore.

Dr. S. C. Mukherjee received the Rajiv Gandhi Sadbhavna Award as the best Agricultural Scientist on May 21, 2007, bestowed by Rajiv Gandhi Foundation at Suchana Bhavan, Bhubaneswar.



Dr. B. K. Mahapatra was awarded the Fellowship of Zoological Society [FZS (Cal.)] in October for his outstanding contribution in Fish Biology, Aquaculture and Fish Breeding.

Dr. B. K. Mahapatra was awarded the Fellowship of Inland Fisheries Society of India (FIFSI) in December 2007 in recognition of his outstanding contributions to Inland Fisheries & Allied Science.

Dr. P. Sardar was awarded best research paper presentation award by Animal Nutrition Society of India for presentation of paper entitled "Effect of different pelleted feeds & feeding methods on performance of carps & freshwater prawn under polyculture" at International Tropical Animal Nutrition Conference organized by Animal Nutrition Society of India, NDRI, Karnal, Haryana during October, 2007.

Dr. S. D. Singh was awarded International Membership of American Fisheries Society and received C. R. Sullivan International Endowment Fund Fellowship from IFS/AFS, USA (2007-08) and received INSA and DBT International Travel Fellowship from Government of India for his visit to USA (2007-08).

Dr. K. K. Jain was awarded the Fellowship of the Academy of Science Engineering and Technology (FASET) by Academy of Science, Engineering and Technology, Bhopal for his outstanding contributions for furthering knowledge systems in service of the society to improve the quality of life of people.

**Dr. A. K. Pal** was elected Fellow of the National Academy of Agricultural Sciences by National Academy of Agricultural Sciences (NAAS), New Delhi.

**Dr. S. B. Jadhao** was elected as an Associate of National Academy of Agricultural Sciences (NAAS), New Delhi.

**Dr. (Mrs) Latha Shenoy** was awarded the Fellowship of the Academy of Science, Engineering and Technology (FASET) by the Academy of Science, Engineering and Technology, Bhopal for her contributions in furthering knowledge systems in service of the society to improve the quality of life of people.

**Dr. M. K. Chouksey** won the Second Prize in Essay Writing Competition in Hindi on Global Warming, organized by 'Nagar Rajbhasha Karyanvayan Samiti, Mumbai' on January 10, 2008.

### Result of ICAR Zonal Tournaments 2007-08

Event	Winner	Position
Kabbadi	CIFE team	2 <sup>nd</sup> position
Badminton	Dr. Shyam Salim Dr. A. K. Verma	Runner Up
Discuss throw(women)	Mrs. S. M. Bagwe	1 <sup>st</sup> position



# 8. Linkages and Collaborations

## 8.1 Collaborations

**Institute of Aquaculture Research (AKVAFORSK), Norway:** For the project “Genetic improvement of *Penaeus monodon* through selective breeding for growth and white spot disease resistance” along with the Central Institute of Brackish Water Aquaculture (CIBA), Chennai

**Australian Centre for International Agricultural Research (ACIAR):** For the Indo-Australian bilateral research project on "Aquaculture in degraded inland areas in India and Australia"

### **MoU with Adikavi Nannaya University, Rajamundry**

CIFE inked a pact with Adikavi Nannaya University, Rajahmundry on 18.02.08 in the presence of Dr. S. Ayyappan, DDG (Fy.), Dr. Dilip Kumar and Dr. Nirupa Rani, Vice-Chancellors of the universities on educational and research collaborations. The important dignitaries viz. Prof. K. Devaraj, Former Vice-Chancellor, UAS, Bangalore, Dr. P. S. R. B. James, Former Director, CMFRI, Dr. K. Janaki Ram, Former Director, CIFA, Dr. N. Sarangi, Director, CIFA, and Dr. T. Rajyalakshmi, Former Director, CIBA also graced the occasion.



## 8.2 Linkages

The institute maintains linkages with various national and international institutions and agencies for educational, research and developmental collaborations.

### International institutions

- WorldFish Center, Penang, Malaysia
- Food and Agriculture Organization of the United Nations, Rome, Italy

### Government of India Organisations

- Integrated Fisheries Project, Kochi
- Central Institute of Coastal Engineering for Fishery, Bangalore
- Central Institute of Fisheries Nautical and Engineering Training, Kochi
- Fishery Survey of India, Mumbai
- Marine Products Export Development Authority, Kochi
- National Remote Sensing Agency, Hyderabad
- Indian Institute of Technology, Kharagpur
- Indian Institute of Technology, Chennai
- Indian Institute of Science, Bangalore
- National Institute of Nutrition, Hyderabad
- Zoological Survey of India, Kolkata
- Bhabha Atomic Research Centre, Mumbai
- Department of Ocean Development, Government of India
- Department of Science and Technology, Government of India
- Department of Biotechnology, Government of India

### ICAR Institutes

- Central Marine Fisheries Research Institute, Kochi
- Central Institute of Brackishwater Aquaculture, Chennai
- Central Institute of Freshwater Aquaculture, Bhubaneswar
- Central Inland Fisheries Research Institute, Kolkata
- Central Institute of Fisheries Technology, Kochi
- National Bureau of Fish Genetic Resources, Lucknow
- National Research Centre on Coldwater Fisheries, Bhimtal
- ICAR Research Complex for Goa, Goa
- ICAR Research Complex for Eastern Region, Patna

### CSIR Institutes

- Industrial Toxicology Research Centre, Lucknow



- Central Drug Research Institute, Lucknow
- Central Institute of Medicinal and Aromatic Plants, Lucknow
- Central Food Technological Research Institute, Mysore
- National Institute of Oceanography, Goa
- Centre for Cellular and Molecular Biology, Hyderabad
- National Botanical Research Institute, Lucknow

#### **Universities**

- Cochin University of Science and Technology, Kochi
- Annamalai University, Chidambaram
- University of Goa, Goa
- Acharya N. G. Ranga Agricultural University, Hyderabad
- Andhra University, Visakhapatnam
- Acharya Nagarjuna University, Guntur
- Mangalore University, Mangalore
- B.S.Konkan Krishi Vidyapeeth, Dapoli
- Maharana Pratap University of Agriculture and Technology, Udaipur

#### **State Governments**

- Department of Fisheries, Government of Haryana
- Department of Fisheries, Government of Uttar Pradesh
- Department of Fisheries, Government of Bihar
- Department of Fisheries, Government of Tamil Nadu
- Department of Fisheries, Government of Andhra Pradesh
- Department of Fisheries, Government of Tripura
- Department of Fisheries, Government of Arunachal Pradesh
- Department of Fisheries, Government of Meghalaya
- Department of Fisheries, Government of Nagaland
- Department of Fisheries, Government of Assam
- Department of Fisheries, Government of Manipur
- Department of Fisheries, Government of Mizoram
- State Institute of Fisheries Technology, Kakinada

#### **Other Organisations**

- Tata Power Company, Mumbai
- ActionAid International, Port Blair
- M. S. Swaminathan Research Foundation, Chennai



# 9. Publications

## 9.1 Research Publications in Refereed Journals

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- Ghosh, S., Sinha, A., and Sahu, C., 2007. Dietary probiotic supplementation in



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- Ghosh, S., Sinha, A., and Sahu, C., 2007. Effect of reproductive performance in female live bearing ornamental fish. *Aquacult. Res.*, 38: 518-526.
- Ghosh, S., Sinha, A., and Sahu, C., 2007. Isolation of putative probionts from the intestines of Indian major carps. *Isr. J. Aquacult. Bamid.*, 59(3): 127-132.
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- Jaiswar, A. K., Kulkarni, B. G. and Chakraborty, S. K., 2007. Diversity indices, distribution pattern and biomass as indicator of health status of aquatic ecosystem. *J. Ecophysiol. Occup. Health*, 7: 25-37.
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## 9.2 Popular Articles

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### 9.3 Abstracts/Presentations in Conferences/Symposia/Seminars/Workshops etc.

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## 9.4 Training Manuals

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- CIFE, 2008. Broodstock Development, Management and Breeding Plans for Quality Seed Production. Training manual, Center for Advanced Studies in Fishery Sciences, Central Institute of Fisheries Education, Mumbai, 239 pp.
- CIFE, 2008. Ornamental Fish Breeding and Culture in Hindi. Central Institute of Fisheries Education Kolkata Centre, Salt Lake, Kolkata, 70 pp.
- Kohli, M. P. S., Dube, K., Saharan, N., Prakash, C., Langer, R. K. and Raju, K. D., 2008. Advances in Aquaculture Technologies. Technical manual, Center for Advanced Studies in Fishery Sciences, Central Institute of Fisheries Education, Mumbai, 316 pp.

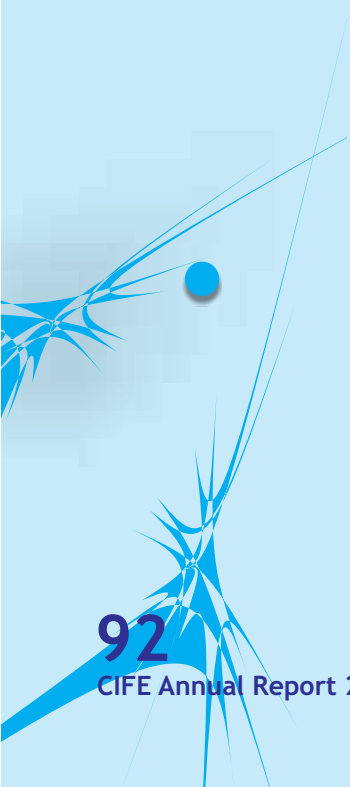
## 9.5 Books/Technical bulletins/brochures

- CIFE and IFA, 2007. Art and Science of Mahseer Conservation and Management. Central Institute of Fisheries Education and Indian Fisheries Association, Mumbai, 113 pp.
- CIFE, 2007. CIFE at a Glance - Brochure. Central Institute of Fisheries Education, Mumbai, 8 pp.
- CIFE, 2007. Vision 2025: Perspective Plan Document. Central Institute of Fisheries Education, Mumbai, 60 pp.
- Kohli, M. P. S., 2007. Ecology and Fisheries of Wetlands in India, Indian Society of Fisheries Professionals, Mumbai, 183 pp.

- Kumar, D., Tiwari, V. K., Chandraprakash and Reddy, A. K., 2007. Fish Culture - At a Glance. Extension Bulletin, CIFE/EB/01/07.
- Kumar, D., Tiwari, V. K., Chandraprakash and Reddy, A. K., 2007. *Matsya Palan - Aik Jhalak*. Extension Bulletin, CIFE/EB/02/07.
- Sinha, A., 2008. Ornamental Fish of India. Central Institute of Fisheries Education, Mumbai, 254 pp.

## 9.6 Book chapters

- Angchook, T., Kohli, M. P. S., Sharma, K. K. and Langer R. K., 2007. Hydrobiological studies of Shivalik Mansar Lake with reference to benthos. *In: Ecology and Fisheries of Wetlands in India* (Ed. M. P. S. Kohli), Indian Society of Fisheries Professionals, Mumbai, pp. 159-165.
- Biradar, R. S. and Kumar, D., 2007. Human resources development in Indian fisheries - past, present and future. *In: Indian Fisheries a Progressive Outlook* (Eds. K. K. Vijayan, P. Jayasankar and P. Vijayagopal), Central Marine Fisheries Research Institute, Kochi, pp. 30-45.
- Mahapatra, B. K., Vinod, K. and Mandal, B. K., 2007. Inland indigenous ornamental fish germplasm of North Eastern India : status and future strategies. *In: Biodiversity and its Significance* (Eds. P. Tandon, Y. P. Abrol and S. Kumaria), I. K. International Publishing House Pvt. Ltd., New Delhi, pp. 134-149.
- Sharma, A., 2008. Fisherwomen and entrepreneurship. *In: Empowerment of Women through Entrepreneurship* (Ed. L. Rathakrishnan), Gyan Publishing House, New Delhi, pp. 347-358.
- Sunitha, N., and Sharma, A., 2007. Issues of patenting of lifeforms. *In: Advances in Fish and Wild Life Ecology and Biology* (Ed. B. L. Kaul), Vol. IV, Daya Publications, Delhi, pp. 113-121.
- Sunitha, N. and Sharma, A., 2007. Trends in patenting activity in indian fisheries sector. *In: The Seventh Indian Fisheries Forum Proceedings* (Eds. Vasudevappa *et al.*), Indian Fisheries Forum, pp. 391-400.
- Wanganeo, A., Wanganeo, R. and Langer, R. K., 2007. Enhancement in reservoir fishery by proper routing of nutrients from catchment area. *In: Recent Advances in Fish Ecology, Limnology and Eco-conservation* (Ed. S. Nath), Vol. VII, pp. 195-199.
- Nandeesh, M. C., Datta, M. K. and Munilkumar, S., 2007. Status of giant freshwater prawn cultivation in Tripura, India. *In: Freshwater Prawns: Advances in Biology, Aquaculture and Marketing..* (Eds. Mohanakumar *et al.*). Allied Publishers Pvt Ltd, New Delhi, pp. 81-86.





# 10. Participation of faculty in workshops, seminars, conferences, meetings, trainings, etc

## 10.1 Workshops/Seminar/Conferences/Congresses

Programme	Period	Venue	Participants
Workshop for the project leaders of the A.P. Cess funded Project “National Risk Assessment Programme for Fish and Fish Products for Domestic and International Markets” organized by CIFT, Kochi	April 10-13, 2007	Kochi	S. Basu
4th Indian Fisheries Science Congress organized by Indian Society of Fisheries Professionals, Mumbai	April 13, 2007	Patna	Dilip Kumar
Workshop on full project proposal for the NAIP project on “Upscaling Mass Seed Production Techniques of Murrels” organized by CARE, St. Xavier’s College, Palayamkottai, Tamil Nadu	January 3-5, 2008	Palayamkottai	M. Abbas
National Seminar on the contribution of Rajeev Gandhi towards 2000 AD for Reconstruction of India	May 21, 2007	Bhubaneswar	S. C. Mukherjee
Conference on “Feed Back of the Trainees and <i>Guru - Sishya</i> Relations”	June 08, 2007	Patna	R. R. Patnaik
3rd zonal workshop on “Fisheries and Aquaculture Policy: Responsible Fisheries and Sustainable Aquaculture Perspectives for West Coast States” organized by CIFE, Mumbai, ICAR Research Complex for Goa, and Department of Fisheries, Government of Goa	June, 20-23, 2007	Goa	S. Basu C. S. Purushothaman, S.C.Mukherjee
4th zonal workshop on “Fisheries and Aquaculture Policy: Alternative Livelihood and Sustainability Perspectives for Northern States” organized by CIFE, Mumbai and Department of Fisheries, Haryana	July, 06-07, 2007	Chandigarh	Dilip Kumar, S. Raizada, N. K. Chadha, S. C. Mukherjee
Special Interactive Workshop on “Administrative and Financial Matters” organized by ISTM, New Delhi	July, 17, 2007	New Delhi	Dilip Kumar, S. C. Mukherjee, C. S. Purushothaman, G. C. Prasad
Workshop on “ <i>Gahan Hindi Prashikshan Byva Karyashala</i> ” organized by NNAR, Hyderabad	July 17-21, 2007	Hyderabad	K. Biswas

NAIP Workshop on “Cotton Value Chain” organized by CIRCOT, Mumbai	July 20, 2007	Mumbai	N. P. Sahu
Workshop on “Partnerships in Reservoir Fisheries Development in India” organized by CIFRI, Barrackpore and NFDB, Hyderabad	July 27, 2007	Bhopal	Dilip Kumar, Somdutt, R. K. Upadhyay
National workshop on “Creating Public Awareness of Environmental Acts at the Ministry of Environment and Forests, Govt. of India as applied to Coastal Zone, Wetlands and Biosphere Reserves” organized by P. R. Government College, Kakinada	August 05, 2007	Kakinada,	R. R. Patnaik,
International workshop on “Aquatic Epidemiology Surveillance and Emergency Preparedness”	September 03-07, 2007	Chennai	R. P. Raman, M. Makesh
National symposium on “Recent Trends in Organic Farming” organized by Mahatma Phule Krishi Vidyapeeth, Rahuri	September 11-12, 2007	Pune	Dilip Kumar, C. S. Purushothaman
Workshop on “Sustainability of Indian Aquaculture Industry (Sustain-aqua 07)” organized by IIT, Kharagpur	September 28-29, 2007	Kharagpur	Dilip Kumar, P. Sardar
Krishak Mela and Sangosthi organized by JNKVV, Jabalpur and Fisheries Commissioner, Jabalpur	October 03-05, 2007	Jabalpur	R. K. Upadhyay
International Tropical Animal Nutrition Conference (TROPNUTRICON 2007)	October 04-07, 2007	Karnal	P. Sardar
The Scoping Workshop on “Aquaculture-based Ecotourism”	October 05, 2007	Neral, Maharashtra	Dilip Kumar, C. S. Purushothaman, P. K. Pandey, M. P. S. Kohli, K. D. Rawat, V. K. Tiwari
Workshop on “Fisheries and Marine Reserves in India” organized by the Greenpeace	October 08-10, 2007	New Delhi	C. S. Purushothaman
Workshop on “Computational Approaches for Predicting Molecular Interactions” organized by IMTECH, Chandigarh	October 09-12, 2007	Chandigarh	A. Chaudhari
National conference on “Development of Higher Education: Expansion, Inclusion and Excellence” organized by UGC, New Delhi	October 10, 2007	New Delhi	C. S. Purushothaman
National Workshop on “Climate Change	October 12-13,	New Delhi	A. K. Pal

Launching Workshop of the Project “Livelihood and Nutritional Security of Tribal Dominated Areas through Integrated Farming Systems and Model Technologies”	October 20-21, 2007	Udaipur	R. S. Biradar
5th Zonal Workshop on “Fisheries and Aquaculture Policy: Sustainable Development and Livelihood Perspectives for Central States” organized by CIFE, Mumbai, IFA, Mumbai, NFDB, Hyderabad, ICAR-RCER, Patna and DoF, Bihar	October 25-27, 2007	Patna	Dilip Kumar, A. Sinha, C. S. Purushothaman
Data analysis workshop under the NORAD project ‘Genetic improvement of <i>P. monodon</i> through selective breeding for growth and white spot disease resistance’, organized by CIFE, Mumbai	October 30 to November 3, 2007	Mumbai	S. C. Mukherjee
8 <sup>th</sup> Asian Fisheries Forum	November 20-23, 2007	Asian Fisheries Society at La Meridian Hotel, Kochi	Participants*
Innovation in Inland Saline Aquaculture in India and Australia organized by CIFE, Mumbai and ACIAR, NSW, Australia	November 28, 2007	New Delhi	Dilip Kumar, C. S. Purushothaman
National Workshop on “Safety at Sea” organized by BOBP-IGO, Chennai	December 03-04, 2007	Chennai	L. Shenoy
International Conference on “Emerging and Re-emerging Viral Diseases of Tropics and Sub-Tropics	December 11-13, 2007	New Delhi	S. C. Mukherjee K. V. Rajendran
Consultative Strategic Workshop on “Strengthening and Capacity Building for Fisherwomen SHGs and Cooperatives in the Konkan Coast of India organized by FAO and Taraporewala Marine Biological Research Station, Mumbai.	December 13-14, 2007	Mumbai	C. S. Purushothaman, S. D. Singh, A. T. Landge, M. K. Chouksey
Diamond Jubilee Seminar of CIFRI on “Ecosystem Health and Fish for Tomorrow”	December 14-16, 2007	Barrackpore	Dilip Kumar, A. Sinha, B. K. Mahapatra, P. Sardar
Synthesizing Workshop on “Fisheries and Aquaculture Policy” organized by CIFE, Mumbai	15-17 December 2007	Mumbai	C. S. Purushothaman, L. Shenoy
Regional Workshop on “Fisheries Conservation and Enhancement: Linking Research and Stakeholders”	December 18-19, 2007	Gawhati	Gopal Krishna

\* Dilip Kumar, S. C. Mukherjee, R. S. Biradar, C. S. Purushothaman, S. D. Singh, S. Basu, S. K. Chakraborty, G. Krishna, K. V. Rajendran, G. Venkateshwarlu, A. Sharma, B. B. Nayak, S. S. Salim, M. Makesh, A. Vennila, U. K. Maheshwari, S. Raizada, N. K. Chadha, A. Sinha, S. Datta, P. Sardar, G. Venugopal, V. K. Tiwari, A. K. Reddy and R. P. Raman

National seminar on “Appropriate Extension Strategies for Management of Rural Resources” organized by UAS, Dharwad	December 18-20, 2007	Dharwad	S. K. Mishra
Indian Social Science Congress XXXI	December 27-31, 2007	Mumbai	A. Sharma
International seminar on “Ornamental Fish Breeding, Farming and Trade and India International (Aquashow - 2008)	January 02-03, 2008	Kochi	C. S. Purushothaman
95 <sup>th</sup> Indian Science Congress	January 03-06, 2008	Visakhapatnam	Dilip Kumar, Gopal Krishna, G. Venugopal, A. Sinha, V. K. Tiwari, B. K. Mahapatra, A. K. Reddy,
International Conference on “Biodiversity, Conservation and Management (BIOCAM 2008)”	January 04, 2008	Kochi.	C. S. Purushothaman
FAO-SIDA International Workshop on “Safety of Shellfish from Harmful Algae and Biotoxins”	January 21-24, 2008	Mangalore	B. B. Nayak
Seminar on “Biodiversity Conservation and Environmental Biotechnology”	January 23-24, 2008	Tenali, Andhra Pradesh	K. P. Prasad
Biodiversity Awareness Workshop organized by CIFE, Mumbai and Biodiversity Authority of India	January 24, 2008	Mumbai	C. S. Purushothaman, G. Venugopal, G. Deshmukhe, A. K. Jaiswar, L. Shenoy
International Seminar on “Ornamentals of Kerala 2008” organized by Department of Fisheries, Kerala and FIRMA, Kochi	February 01-02, 2008	Kochi	S. S. H. Razvi
International Seminar on “Ornamental Fish Breeding, Farming and Trade”	February 02-04, 2008	Kochi	Dilip Kumar
International Conference on Biodiversity Conservation and Management (BIOCAM 2008) organized by CUSAT, ZSI, Magadh University, Bodh Gaya, Sankaracharya Univ. of Sanskrit, Kaladi	February 03-06, 2008	Kochi	S. S. H. Razvi
National Seminar on “Developing Strategies for Domestic Marketing of Fish and Fishery Products”	February 07-08, 2008	Nellore, Andhra Pradesh	K. P. Prasad, P. S. Ananthan



10 <sup>th</sup> Indian Agriculture Scientist and Farmers Congress	February 16-17, 2008	Allahabad	Dilip Kumar
Stakeholders' Workshop on the Dissemination of Fish Processing Technologies of CIFE/others organized by CIFE, Mumbai and Technology Development Centre, New Delhi	February 19, 2008	Mumbai	C. S. Purushothaman
Workshop on "New Directions and Dimensions for Aquaculture and Fisheries in East and West Godavari" organized by CIFE, Mumbai and Adikavi Nannya University, Rajamundry	February 19, 2008	Rajamundry, Andhra Pradesh	G. Venugopal, S. S. H. Razvi, M. Abbas, K. B. Sreeramamurty, R. R. Patnaik
Workshop on "Possibilities of Prawn Farming in Haryana" organized by Department of Fisheries, Haryana	February 28, 2008	Hisar	S. Raizada, N. K. Chadha
Workshop on "Research Techniques in Cyanobacteriology and Bioinformatics for Cyanobacteriologists" organized by NFMC, Bharathidasan University, Trichirappalli	March 03-07, 2008	Trichirappalli, Tamil Nadu	A. Vennila
SAARC Conference 2008: Science-based Agricultural Transformation towards Alleviation of Hunger and Poverty in SAARC Countries	March 05-07, 2008	New Delhi	Dilip Kumar, C. S. Purushothaman
Orientation Workshop for Coordinators of Field Experience Training of the newly recruited ARS Scientists organized by NAARM, Hyderabad	March 06-07, 2008	Hyderabad	G. Venugopal, S. K. Mishra
Workshop on "Presentation Skills" organized by Institute of Secretariat Training and Management, Department of Personnel and Training, Government of India, New Delhi	March 10-11, 2008	New Delhi	S. Jahageerdar
Priority setting, Monitoring and Evaluation in National Agricultural Innovation System	March 24-28, 2008	IIM, Lucknow	R. S. Biradar
UGC sponsored National Seminar on "Recent Advances in Fish and Fisheries"	March 25-26, 2007	B. R. Ambedkar Bihar University, Bihar	Dilip Kumar

## 10.2 Training Programmes\Summer schools/Winter schools

Programme	Period	Organized by	Participants
Training Workshop for Consortia Partners to familiarize with Procurement Procedure of the World Bank	April 16-17, 2008	BAIF Development Foundation, Pune	R. S. Biradar, Sunil Kumar, T. Padmavati
Improving Administrative Efficiency and Financial Management	June 12-19, 2007	NAARM, Hyderabad	S. S. Kocharekar, V. Pavithran
Training Programme on "Molecular Biology Techniques"	August 01-30 2007	CCMB, Hyderabad	M. Abbas, P. S. Rao
Training Programme on "E-learning"	20-25 August 2007	NAARM, Hyderabad	Rama Sharma
Training Programme on "Genomic and Protein Based Veterinary Diagnostics"	September 06-26, 2007	Madras Veterinary College, Chennai	M. Makesh
Training program on "Intelligent Reporting system (IRS) developed by ICAR"	September 10-11, 2007	IASRI, New Delhi	R. H. Khandagale
Training program on "Perspectives and Current Trends in Bioinformatics"	September 12-18, 2007	CCMB, Hyderabad	S. Jahageerdar
Intensive Fish Cultivation Training Programme	October 11-30, 2007	International Training Centre, Galilee College, Israel	U. K. Maheshwari
Winter School on "Bioprocessing Technologies in Utilization of Crop Residues for Production of Enzymes and Biofuels"	October 16 to November 05, 2007	CIPHET, Ludhiana	A. Vennila
Management Development Programme on Managerial Effectiveness	November 26-31, 2007	IIM, Calcutta	Suresh Kumar
Winter School on "Recent Advances in Freshwater Aquaculture Nutrition"	November 28 to December 18, 2007	CIFA, Bhubaneswar	G. H. Pailan
Team Building Workshop cum Training	December 12-15, 2007	NAARM, Hyderabad	K. P. Prasad

Short-term Training Programme on “Integrating Spatial and Non- Spatial Natural Resources for Sustainable Watershed Management”	January 9-15, 2008	Water Technology Centre for Eastern Region, Bhubaneswar	R. Singh
Training Programme on “Finance for Non-finance Executive Schedule”	February 11-15, 2008	ASCI, Hyderabad	Suresh Kumar
Training Programme on “Capacity Building for Intellectual Property Protection and Technology Licensing in Agriculture under Indo-US Agricultural Knowledge Initiative”	February 14-16, 2008	NAARM, Hyderabad	S. Prakash, C. Prakash
CAS Training Programme on “Brood Stock Development, Management and Breeding Plans for Quality Seed Production”	February 26 - March 17, 2008	CIFE, Mumbai	Rama Sharma
Management Development Programme on “PME for Agriculture Research”	March 24-28, 2008	IIM, Lucknow	R. S. Biradar, C. S. Purushothaman, G. Venugopal
NAARM Off-campus Specialized Training for CIFE Faculty	March 31 to April 02, 2008	CIFE, Mumbai	R. S. Biradar, C. S. Purushothaman, Gopal Krishna, G. Venkateshwarlu, S. K. Mishra, A. Sharma, S. P. Shukla, A. Vennila
CAS Training Programme on “Nutritional Biotechnology for Qualitative and Quantitative Enhancement in Food Fishes”	March 31 - April 20, 2008	CIFE, Mumbai	Asha T. Landge

### 10.3 Brainstroming sessions/Awareness Camps/Farmers' meet

3 <sup>rd</sup> Brainstorming Session on “Agriculture Educational Policy”	March 8-9 ,2008	Punjab Agricultural University, Ludhiana	Dilip Kumar
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## 10.4 Important meetings

Network Meeting of Fish Nutrition Experts in ICAR	April 21-22, 2007	NAAS Complex, ICAR, New Delhi	S. D. Singh K. K. Jain A. K. Pal N. P. Sahu
Meeting of DBT Task Force on Aquaculture and Marine Biotechnology	May 18, 2007 and March 17-18, 2008	Department of Biotechnology, New Delhi	Dilip Kumar
Fourteenth Annual General Body Meeting of the National Academy of Agricultural Sciences, and National Symposium on "Agriculture Cannot Wait: New Horizons"	June 04-05, 2007	NAAS Complex, New Delhi	S. Jadhao
Meeting at CDRI, Lucknow to discuss the Organization of "Steering Committee Meeting of the Drug from the Sea"	July 25, 2007	Lucknow/Ministry of Earth Sciences, New Delhi	Dilip Kumar
Meeting with Bio-ved Research and Communication Centre, Lucknow	July 26, 2007	National Botanical Research Institute, Lucknow	Dilip Kumar
Meeting on "Management of Agricultural Information and Dissemination - Role of DIPA"	August 04, 2007	National Institute of Research on Jute and Allied Fibre Technology, Kolkata	P. Sardar
Central Joint Staff Council Meeting	September 15, 2007	NAARM, Hyderabad	Dilip Kumar
Meeting on "Interactive Session on Delineation"	September 25, 2007	Planning Commission, New Delhi	Dilip Kumar
The 200 <sup>th</sup> meeting of the Executive Council of Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth	October 19, 2007	Dapoli	Dilip Kumar
Regional Agriculture Fair	November 03-05, 2007	Motihari, Patna	Dilip Kumar
Institute Management Committee Meeting	December 07, 2007	CIFA, Bhubaneswar	A. Chaudhari
Meeting with the Secretary, Ministry of Fisheries, Director of Fisheries and Fisheries Development Advisor to the Government of Tripura	December 27, 2007	Agartala	Dilip Kumar
XX Meeting of ICAR Regional Committee No. VII	February 29 - March 01, 2008	CICR, Nagpur	Dilip Kumar
13 <sup>th</sup> Meeting of the Technical Advisory Group of NAIP, Component -2	March 10-11, 2008	KAB - II, New Delhi	Dilip Kumar, A. K. Reddy, S. Munilkumar, S. P. Shukla
Microtron Advisory Committee (MAC)	March 10 -12, 2008	Mangalore University, Mangalore	N. P. Sahu



## 10.5 Important Invited Lectures

S. no.	Speaker	Title / occasion	Venue	Date
1.	Dilip Kumar	Fisheries Sector - An overview for the ARS Probationers	NAARM, Hyderabad	May 04-05, 2007
2.	A. Chaudhari	Transgenic Fish: Technology and Applications/Summer School on Fish Biotechnology	NBFGR, Lucknow	July 24, 2007
3.	Dilip Kumar	Promotion of Sustainable Aquaculture through Sharing of Experiences among Regional Aqua Farmers	CIFA, Bhubaneswar	August 21, 2007
4.	S. D. Singh	Capacity Building for International Biotechnological Training to Enhance the Quantitative and Qualitative Traits in Commercially Important Fishes for Sustainable Fisheries/137 <sup>th</sup> Annual Meeting of American Fisheries Society	AFS, San Francisco	September 02-06, 2007
5.	Somdutt and R. K. Upadhyay	Capacity Building of KVK Officials	Jawaharlal Nehru Krishi Vishwa Vidhyalaya, Jabalpur	October 23-25, 2007
6.	S. C. Mukherjee	Laboratory Diagnosis of Animal Diseases and Zoonoses	IVRI, Kolkata	December 14, 2007
7.	A. Chaudhari	Control of Shrimp Viral Diseases using RNA interference/National Conference on Marine Biology to Marine Biotechnology,	Ruparel College, Mumbai	January 07 ,2008
8.	C. S. Purushothaman	Aquatic Microbial Diversity and its Significance/Biodiversity Awareness Workshop	CIFE, Mumbai and Biodiversity Authority of India	January 24, 2008
9.	Dilip Kumar	Keynote Address at the Inaugural Function of the International Seminar on Ornamental Fish Breeding, Farming and Trade	Hotel Renaissance, Kochi	February 02-04, 2008
10.	A. Chaudhari	Value Addition to Ornamental Fishes using Biotechnological Approaches - Status, Possibilities and Concerns/International Seminar on Ornamental Fish Breeding, Farming and Trade	Kochi	February 03, 2008

11.	G. Venugopal	Potential Alternative Candidate Species in Brackishwater Aquaculture/Workshop on “New Directions and Dimensions Aquaculture and Fisheries in East and West Godavari”	Adikavi Nannya University, Rajamundry	February 19, 2008
12	S. D. Singh	Application of Biotechnology in Fish Nutrition and Aquaculture/ICAR-sponsored Training Programme	Fisheries College, Ratnagiri	March 08, 2008
13.	S. C. Mukherjee	“Application of biotechnology in health management in aquaculture for quarantine” in CAS Training programme on “Brood stock Development, Management and Breeding Plans for Quality Seed Production	CIFE, Mumbai	March 11, 2008
14.	S. D. Singh	National workshop on Status and Perspective of Biotechnology in Animal Feeds and Feeding	Indian Veterinary Research Institute, Izatnagar	March 11-12 2008
15.	S. D. Singh	Status and Perspective of Fisheries Education in India/National Seminar on Golden Jubilee Celebration of NDRI	NDRI, Karnal	March 12-13 , 2008

# 11. Organization of meetings, workshops, seminars, CAS programmes, etc.

## 11.1 Meetings

S. no.	Programme	Period
1.	Town Official Languages implementation Committee (North Mumbai)	August 03, 2007 January 10, 2008
2.	Board of Examinations	April 05, 2007, September 10, 2007 November 07, 2007 March 07, 2008 March 24, 2008
3.	Review meeting between the ACIAR officials and the project personnel of the Indo-Australian bilateral project by CIFE, Rohtak Centre	April 17-18, 2007 November 30, 2007
4.	Meeting between CIFE and Haryana Fisheries Department officials in connection with development of prawn farming in Haryana State by CIFE, Rohtak Centre	April 25, 2007
5.	Consultative Committee Meeting of Fisheries Survey of India	May 09, 2007
6.	Human Resource Development Committee Meetings	May 18, 2007 July 17, 2007 September 12, 2007 November 19, 2007
7.	Quinquennial Review Team	June 25-26, 2007
8.	Staff Research Council	June 28-30, 2007 December 01, 2007
9.	Extension Council	August 04, 2007
10.	Hindi Meeting on Rajbhasha Karyanvyan Samiti 55 <sup>th</sup> Meeting 56 <sup>th</sup> Meeting 57 <sup>th</sup> Meeting	August 16, 2007 December 21, 2007 March 22, 2008
11.	Expert Committee Meeting for the formulation of syllabi for the new M.F.Sc. (Aquatic Environmental Management) Programme	August 24-25, 2007
12.	Expert Committee Meeting for the formulation of syllabi for the new M.F.Sc. (Fisheries Extension) Programme	August 30-31, 2007
13.	Academic Council	September 07, 2007 February 22, 2008
14.	Discussions on the project entitled Empowerment of Coastal Artisanal Fishing Communities for Livelihood Development and Sustainable Resource Use at CIFE, Kakinada Centre	October 11-13, 2007
15.	Expert Consultation on Aquatic Animal Physiology	November 02-03, 2007
16.	Research Advisory Committee	December 03, 2007
17.	Meeting of the Broad Subject Matter Area (BSMA) Committee of ICAR	March 12, 2008

## 11.2 Conferences/Symposia/Workshops/Seminars/Brainstorming Sessions/Awareness Camps

S. no.	Programme	Venue	Period
1.	3 <sup>rd</sup> Zonal Workshop on “Fisheries and Aquaculture Policy: Responsible Fisheries and Sustainable Aquaculture Perspectives for West Coast States”	ICAR Research Complex for Goa, Goa	June 21-23, 2007
2.	4 <sup>th</sup> Zonal Workshop on “Fisheries and Aquaculture policy: Alternative Livelihood and Sustainability Perspectives for Northern States”	Chandigarh	July 06-07, 2007
3.	A Scoping Workshop on “Fisheries Based Eco-Tourism”	Saguna Baug, P.O. Neral, Dt: Raigarh, Maharashtra	October 05, 2007
4.	5 <sup>th</sup> Zonal Workshop on “Fisheries and Aquaculture Policy: Sustainable Development and Livelihood Perspectives for Central States”	Patna	October 25-27, 2007
5.	Workshop for the Stakeholders on MoES Project	CIFE Kakinada Centre	November 14, 2007
6.	Workshop on "Innovations in inland saline aquaculture in India and Australia" under the Indo-Australian bilateral project on "Developing aquaculture in degraded inland areas in India and Australia".	NASC, New Delhi	November 28, 2007
7.	Synthesizing Workshop on “Fisheries and Aquaculture Policy”	CIFE, Mumbai	December 15-19, 2007
8.	Dimbhe Reservoir Fisher folk meet on the Importance of Fisheries in The Livelihood Development of Katkari Tribals	Dimbhe, Thane	January 30 - February 01, 2008
9.	Biodiversity Awareness Workshop	CIFE, Mumbai	January 24, 2008



### 11.3. CAS Programmes

S. No.	Programme	Period
1.	Advances in Aquaculture Technologies	January 8-28, 2008
2.	Brood-stock Development, Management and Breeding Plans for Quality Seed Production	February 26 - March 17, 2008
3.	Nutritional Biotechnology for Qualitative and Quantitative Enhancement in Food Fishes	March 31 to April 20, 2008



## 11.4. Zonal workshops

### Third Zonal Workshop on Fisheries and Aquaculture Policy for the West Coast States at Goa

The 3rd Zonal Workshop on Fisheries and Aquaculture Policy for the West Coast states of India was organized by Central Institute of Fisheries Education (CIFE), Mumbai, in collaboration with the ICAR Research Complex, Goa, and the Departments of Fisheries of Goa, Gujarat, Karnataka, Kerala, Maharashtra and Union Territories of Daman and Diu, Dadra & Nagar Haveli and Lakshadweep during 21-23 June 2007. The Workshop was inaugurated by Shri Bhupendrasinh Manubha Chudasama, Hon'ble Minister of Agriculture, Animal Husbandry and Fisheries, Govt. of Gujarat, at ICAR-Research Complex, Old Goa on 21st June 2007.



### Fourth Zonal Workshop on Fisheries and Aquaculture Policy for Northern States at Chandigarh

The 4th Zonal Workshop on Fisheries and Aquaculture Policy for Northern States Haryana, Punjab, Himachal Pradesh, Rajasthan, Delhi, Uttarakhand and Jammu & Kashmir was organized at Haryana Niwas, Chandigarh during 6-7 July, 2007. In partnership with Departments of Fisheries Governments and Indian Fisheries Association (IFA), Mumbai.

The Workshop was inaugurated by His Excellency Dr. A.R. Kidwai, Hon'ble Governor of Haryana, on Friday 6th July, 2007. Dr. Dilip Kumar, Director, CIFE, Mumbai, outlined the overview of the workshop and the focal issues behind it. The Secretaries and Directors of DoFs from the above participating States, fish farmers, fishers, co-operative societies, NGOs, bank representatives scientists, academicians, and policy planners attended the programme. Directors from the participating States made detailed presentations on the relevant and pertinent policy issues and constraints confronting the fisheries sector in the concerned States. It was followed by "Open Forum" where all the stakeholders presented their respective policy perspectives.





The second day started with Lead presentations of the experts presented the policy issues in different sub-sectors of fisheries and aquaculture including the policy issues in marketing, HRD and the service delivery systems. The flagged issues were then subjected to informal but intense and focused group discussions in four separate work groups. The specific inputs for policy guidelines that emerged from each of the work group were presented in the plenary session.

### **Fifth Zonal Workshop on Fisheries and Aquaculture Policy: Sustainable Development and Livelihood Perspectives for Central States at Patna**

The 5th Zonal Workshop on Fisheries and Aquaculture Policy: Sustainable Development and Livelihood Perspectives for Central States” was organized at the sprawling Hindi Bhawan, Patna during 25 - 27 October 2007. The workshop was inaugurated by Shri Kumar Hon'ble Chief Minister, Uttar Bihar. The Workshop was divided into technical sessions wherein existing policies and regulatory environment, and flagging of policy related issues in the participating states of Bihar, Chattisgarh, Jharkhand, Madhya Pradesh and Uttar Pradesh were presented followed by focussed group discussions and a final concluding session in which outcome of the Workshop was presented and recommendations were made.





**Inauguration of giant freshwater prawn hatchery complex at CIFE Rohtak Centre by His Excellency Dr. A.R.Kidwai, Governor of Haryana**

## 12. Distinguished Visitors

### CIFE, Mumbai

Visitor Name	Position/Address	Date of Visit
Dr. Seth	Principal Scientist, Allahabad Research Centre of CIFRI, Barrackpore	January 09, 2007
Dr. Bruce Philips	Adjunct Professor, Curtin University, Australia	January 16, 2007
Dr. Ravi Fotedar	Associate Professor, Curtin University, Australia	January 16, 2007
Dr. S. Nathak	International Expert on Sustainable Energy	February 27, 2007
Dr. Y. Basavaraju	Professor & Head, Inland Fisheries Research and Information Center, KVAFSU, Bangalore	March 06, 2007
Dr. K. Gopakumar	Chairman, Research Advisory Committee and Ex. DDG (Fy.).	March 29, 2007
Dr. A. D. Diwan	Assistant Director General (Marine Fisheries), ICAR	April 07, 2007
Dr. S. Mathavan	Genome Institute of Singapore, Singapore	September 22, 2007
Dr. S. Kannainyan	Chairman, National Biodiversity Authority, Chennai	September 27, 2007
Dr. Mohammed Rais	Senior Advisor, UNDP, Kabul, Afghanistan	October 17, 2007
Dr. Mohammed Rais	Senior Advisor, UNDP, Kabul, Afghanistan	October 20, 2007
Dr. Mortan Rye	Scientific Director and Senior Fish Breeder, AKVAFORSK Genetic Centre, Sundalsora	October 31, 2007 November 01, 2007
Dr. V. R. P. Sinha	Ex-Director, CIFE and Renowned Global Aquaculturist	November 01, 2007
Dr. Ben Hayes	Group Leader, Computational Biology, Dept. of Primary Industries, Victoria, Australia	November 01, 2007
Mr. Udai Shankar Sethi	Aquaculture Expert working with Iran Aquaculture System	December 06, 2007



## Kakinada Centre

Visitor Name	Position/Address	Date of Visit
Dr. S. Ayyappan	Deputy Director General (Fisheries), ICAR, New Delhi	February 18, 2008
Dr. K. Janaki Ram	Former Director, CIFA, Bhubaneswar	February 18, 2008
Dr. G. R. M. Rao,	Former Director, CIBA, Chennai	November 07, 2007
Dr. Babu Rao	Retd. Principal, College of Fisheries, Nellore, A.P.	November 07, 2007
Dr. Sivananda Murty	Director of Extension, KVAS University, Bidar, Karnataka	December 07, 2007
Sh. K. L. Durgesh	M.L.C. (Govt. of Andhra Pradesh)	April 18, 2007
Shri N. Sessa Reddy	M.L.C. (Govt. of Andhra Pradesh)	July 10, 2007

## Powarkheda Centre

Visitor Name	Position/Address	Date of Visit
Shri Moti Kashyap.	Hon'ble State Fisheries Minister, Vallabh Bhawan, Bhopal (M.P.)	September 26, 2007
Shri Madhukar Rao Harney	MLA, Hoshangabad	September 26, 2007
Shri Girija Shankar Sharma	MLA, Itarsi	September 26, 2007
Dr. S. N. Dwivedi	Former Director, CIFE, Mumbai	September 26, 2007 March 16, 2008
Shri H. S. Siddhu	Director of M.P. Fisheries, Bhopal	September 26, 2007 March 11, 2008

## Kolkata Centre

Visitor Name	Position/Address	Date of Visit
Dr. Mangala Rai	Secretary DARE and Director General, ICAR, New Delhi	December 16, 2007
Dr. S. Ayyappan	DDG (Fisheries), ICAR, New Delhi	December 16, 2007
Dr. H. S. Sen,	Director, CRIJAF, Barrackpore	December 16, 2007 December 12, 2007
Dr. N. Sarangi	Director, CIFA, Bhubaneswar	December 16, 2007
Dr. Deepak Sarkar	Head, NBSS LUP, Salt Lake, Kolkata	December 16, 2007
Dr. K. C. Dora	Dean, Faculty of Fisheries Science, WBUA&FS, Kolkata	December 16, 2007
Dr. S. A. H. Abidi	Former Director, CIFE, Mumbai and Former Member, ASRB, New Delhi	December 6, 2007 December 14, 2007
Dr. S. N. Dwivedi	Former Director of CIFE, Mumbai	December 17, 2007
Dr. V. V. Sugunan	ADG (Inland Fisheries) New Delhi	December 18, 2007
Dr. U. C. Goswami	Professor & Head, Deptt. Of Zoology, Guwahati University, Guwahati	January 16, 2008
Prof. N. C. Datta	Retired Professor, Department of Zoology, Calcutta University, Kolkata	January 21, 2008
Dr. C. Saha	Former Director of CIFA, Bhubaneswar	January 26, 2008
Dr. S. C. Pathak	Former Chief General Manager (Tech.) NABARD, Mumbai	February 1, 2008
Dr. K. K. Vass	Director, CIFRI, Barrackpore	March 9, 2008.

## Rohtak Centre

Visitor Name	Position/Address	Date of Visit
Dr. A. R. Kidwai	His Excellency Governor of Haryana	August 20, 2007
Dr. S. Ayyappan,	DDG (Fy.), ICAR, New Delhi	August 20, 2007
Shri P. V. Singh	Director, Dept. of Fisheries, Haryana	August 20, 2007
Dr. V. V. Sugunan	ADG (Inland Fisheries), ICAR, New Delhi	August 20, 2007
Shri Dev Dutt	IAS, Secretary Fisheries, Govt. of U.P	October 01, 2007
Dr. Barney Smith	Fisheries Program Manager, ACIAR	November 30, 2007
Dr. Stewart Fielder	Project Leader of Indo-Australian Bilateral Project	April 16-19, 2007 November 28-30, 2007
Dr. Geoff Allan	Senior Program Manager, ACIAR, Australia and Project Associate of Indo- Australian project	November 24, 2008
Dr. Kuhu Chatterjee	Regional Manager, ACIAR - South Asia, Australian High Commission, New Delhi	April 03, 2007 November 30, 2007
Ms. Simrat Labana	Program Manager, ACIAR, Australian High Commission, New Delhi	April 03, 2007
Ms. Mellisa Merino	Australian Journalist	October 11, 2007

# 13. Others

## 13.1 Quinquennial Review Team

### Chairperson

**Dr. M. L. Madan**, Vice Chancellor, Pt. Deendayal Upadhaya University of Veterinary Science, Mathura

### Members

**Dr. I. Karunasagar**, Professor & Head Department of Microbiology, College of Fisheries, Mangalore-575002

**Dr. P. S. B. R. James**, Former Director, CMFRI, House No. M-9, 3<sup>rd</sup> B Main, 2<sup>nd</sup> Cross, Prem Nivas Road, (behind Nethra Farm), P.O. St. Thomas Town, Kammanahalli, Bangalore-560084

**Dr. T. P. Singh**, Retd. Professor, B.H.U. Sri Ganesh Dham Colony, N8/236-R-52, Naveda Sundarpur, Varanashi-221005

**Dr. M. Babu Rao**, Retd Principal, College of Fisheries Science, ANGRAU, Flat No. 204, Subabhi Enclave, Road No. 14, Banjara Hills, Hyderabad-500034

### Member Secretary

**Dr. R. S. Biradar**, Principal Scientist, Central Institute of Fisheries Education, Mumbai-400061

## 13.2. Research Advisory Committee

### Chairperson

**Dr. K. Gopakumar**, Ex-DDG (Fisheries), ICAR, 28/863, Cheruparamsath Road, Kadavanatara, Kochi-682020

### Members

**Dr. Rakesh Bhatnagar**, Professor, Department of Biotechnology, Jawaharlal Nehru University, New Delhi-110067

**Dr. Kaushal Kumar**, Professor and Head, Department of Zoology, DDU Gorakhpur University, Gorakhpur-273009

**Dr. Brij Gopal**, Professor, Department of Environmental Science, Jawaharlal Nehru University, New Delhi-110067

**Dr. M. Devaraj**, Ex-Director CMFRI, Kavya Illam, Main Road, Chenbagaramanputhooor (P.O.), Via- Nagercoil

### Member Secretary

**Dr. R. S. Biradar**, Principal Scientist, Central Institute of Fisheries Education, Mumbai-400061

## 13.3. Board of Management

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**Dr. Dilip Kumar**, Director, Central Institute of Fisheries Education, Mumbai-400061

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**Dr. S. Ayyappan**, Dy. Director General (Fishery), ICAR, Pusa, New Delhi-110014

**Dr. S. S. Baghel**, Vice-Chancellor, Assam Agricultural University, Jorhat-785013

**Dr. Vijay B. Mehta**, Vice-Chancellor, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri-415712

**Dr. S. C. Mukherjee**, Joint Director, Central Institute of Fisheries Education, Mumbai-400061

**Dr. K. K. Vass**, Director, Central Inland Capture Fisheries Research Institute, Barrackpore, Kolkata-743101

**Dr. W. S. Lakra**, Director, National Bureau of Fish Genetic Resources, Canal Ring Road, Po-Dilkush, Lucknow-226002

**Shri M. K. R. Nair**, Fisheries Development Commissioner, Government of India, Ministry of Agriculture, Krishi Bhavan, New Delhi-110114

**Dr. M. V. Gupta**, FAO World Food Prize Laureat, Padmajalaya, Plot No-20, Srinagar Colony, Hyderabad-500073

**Dr. Nagendra Sharma**, Vice Chancellor, Sher-E-Kashmir University of Agriculture Science & Technology, Jammu-180012

**Shri Deepak P. Gadre**, President, Ratnagiri Sindhudurg Fisheries Development Association, 3298-A, Mirkarwada, Ratnagiri-415612

**Shri Damodar Tandel**, 37 Gharkul, Machchimar Nagar, Captain Prakash Peth Marg, Cuffe Parade, Mumbai-400005

**Dr. C. S. Purushothaman**, Principal Scientist, Central Institute of Fisheries Education, Mumbai-400061

**Dr. A. K. Pal**, Principal Scientist, Central Institute of Fisheries Education, Mumbai-400061

**Dr. Gopal Krishna**, Principal Scientist, Central Institute of Fisheries Education, Mumbai-400061

**Dr. S. N. Ojha**, Principal Scientist, Central Institute of Fisheries Education, Mumbai-400061

**Dr. (Mrs.) Latha Shenoy**, Senior Scientist, Central Institute of Fisheries Education, Mumbai-400061

**Dr. G. Venugopal**, Principal Scientist, CIFE Kakinada Centre, Near old Burmah Shell, Beach Road, Kakinada -533007

**Dr. Somdutt**, Principal Scientist, CIFE Powerkheda Centre, Powerkheda, Hoshangabad-461110

**Dr. G. Venkateshwarlu**, Principal Scientist, Central Institute of Fisheries Education, Mumbai-400061

**Dr. M. P. Singh Kohli**, Principal Scientist, Central Institute of Fisheries Education, Mumbai-400061

**Dr. R. S. Biradar**, Principal Scientist, Central Institute of Fisheries Education, Mumbai-400061



**Financial Advisor**, Indian Council of Agricultural Research, Krishi Bhavan, New Delhi-110114

**Member Secretary**

**Shri Suresh Kumar**, Sr. Administrative Officer, Central Institute of Fisheries Education, Mumbai-400061

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**Vice Chairman**

**Dr. S. C. Mukherjee**, Joint Director & Head, Aquatic Animal Health Management Division, CIFE, Mumbai

**Members**

**Dr. R. S. Biradar**, Principal Scientist & Head, Fishery Informatic & Technology Evaluation & Transfer Division, CIFE, Mumbai

**Dr. M. P. Singh Kohli**, Principal Scientist & Head, Aquaculture Division, CIFE, Mumbai

**Dr. Lalji Singh**, Director, CCMB, Uppal Road, Hyderabad-500007

**Dr. P. Keshavnath**, Dean, College of Fisheries, Mangalore

**Dr. Jankiram**, Former Director, Central Institute of Freshwater Aquaculture, Bhubaneswar

**Dr. Prabhu Pandey**, Head, PG Department of Zoology, Ranchi University, Ranchi

**Dr. S. K. Chakraborty**, Principal Scientist & Head, Fisheries Resource Management Division, CIFE, Mumbai

**Dr. C. S. Purushothaman**, Principal Scientist & Head, Aquatic Environmental Management Division, CIFE, Mumbai

**Dr. Gopal Krishna**, Principal Scientist & Head, Fish Genetics & Biotechnology Division, CIFE, Mumbai

**Dr. S. D. Singh**, Principal Scientist & Head, Fish Nutrition & Biochemistry Division, CIFE, Mumbai

**Dr. S. Basu**, Principal Scientist & Head, Harvest & Post harvest Technology Division, CIFE, Mumbai

**Dr. Neelam Saharan**, Principal Scientist, representatives from the Post Graduate faculty, CIFE, Mumbai

**Dr. Latha Shenoy**, Sr. Scientist, representatives from the Post Graduate faculty, CIFE, Mumbai

**President**, PGSSU, student representative, CIFE, Mumbai  
**Academic Council Representative (Student)**, CIFE, Mumbai

**Dr. S. Ehteshamuddin**, Vice-Chancellor, Patna University, Patna-800005, the representative of the U.G.C

**Dr. Mritunjaya**, DDG (Education), ICAR (DDG Education ICAR or his nominee)

**Member Secretary**

**Shri Chironji Lal**, Registrar/CAO, CIFE, Mumbai

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**Dr. P. Das**, DDG (Extension Education), ICAR, New Delhi

**Dr. R. S. Biradar**, Head, Fisheries Information Technology Evaluation and Transfer Division, CIFE, Mumbai

**Dr. M. P. Singh Kohli**, Head, Aquaculture Division, CIFE, Mumbai

**Dr. S. Basu**, Head, Fish processing and Product development, CIFE, Mumbai

**Dr. K. K. Jain**, Principal Scientist, Fish Nutrition and Biochemistry Division, CIFE, Mumbai

**Dr. Somdutt**, Sr. Scientist and OIC, CIFE Powerkheda Centre

**Dr. G. Venugopal**, Principal Scientist and OIC, CIFE kakinda Centre

**Dr. A. K. Jain**, Senior Scientist and OIC CIFE, Centre Lucknow

**Dr. Kiran Dube**, Senior Scientist, Aquaculture Division, CIFE, Mumbai

**Dr. V. K. Tiwari**, Senior Scientist, Aquaculture Division, CIFE, Mumbai

**Dr. S. G. Raje**, Senior Scientist, CMFRI Centre, Mumbai

**Dr. D. P. S. Chauhan**, Deputy Commissioner (Fisheries), Department of Agriculture, Government of India, New Delhi

**Dr. N. Sarangi**, Director, CIFE, Bhubaneswar, Orissa

**Mr. Vinod Naik**, Assitant Director of Fisheries, Kuldip Archieve near Railway Crossing Navalo Road Palghar, Thane

**Mr. U. M. Sawant**, Assitant Fisheries Development Officer, C/o Assitant Director of Fisheries, Kuldip Archive, near Railway Crossing, Navalo Road, Palghar, Thane

**Dr. M. V. Gupta**, Former Assistant Director General, International Relations and Partnerships, World Fish Centre Research Coordinator, International Network on Genetics in Aquaculture (INGA)

**Member Secretary**

**Dr. S. N. Ojha**, Senior Scientist, Fisheries Information Technology Evaluation and Transfer Division, CIFE, Mumbai

# 14. Personnel

## CIFE, Mumbai

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### Joint Director

Dr. S. C. Mukherjee

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Dr. M. P. Singh Kohli

Dr. R. S. Biradar

Dr. C. S. Purushothaman

Dr. S. D. Singh

Dr. S. Basu

Dr. S. K. Chakraborty

Dr. P. K. Ghosh

Dr. K. K. Jain

Dr. A. K. Pal

Dr. (Mrs.) Neelam Saharan

Dr. (Mrs.) Kiran Dube Rawat

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Dr. K. V. Rajendran

Dr. G. Venkateshwarlu

Dr. Gopal Krishna

### Senior Scientists

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Dr. (Ms) Geetanjali Deshmukhe

Dr. N. K. Chadha

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Dr. N. P. Sahu

Dr. V. K. Tiwari

Dr. S. Jahageerdar

Dr. K. Venkateshvaran

Dr. B. B. Nayak

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Dr. R. P. Raman

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Dr. Chandra Prakash

Dr. Subodh Gupta

Dr. S. Munilkumar

Dr. Rupam Sharma

Dr. Sumanta Kumar Mishra

Dr. Gayatri Tripathi

Dr. Satya Prakash Shukla

Dr. Swadesh Prakash

### Scientist (Senior Scale)

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Dr. Makesh M.

Dr. Shyam S. Salim

Dr. A. Vennila

Dr. P. S. Ananthan

### Scientists

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Dr. Ajit Kumar Verma

Mrs. Vidyashree Bharati

### Technical Staff

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Mr. N. L. Singh

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Dr. Zeba Jaffer Abidi (on deputation)

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Mrs. V. D. Misale  
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Mr. Mohd. Baqar  
Mrs. Shahila Iftekhar

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Section**

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Mr. Chironji Lal

**Sr. Administrative Officer**

Mr. Suresh Kumar

**Finance & Accounts Officer**

.....

**Administrative Officer**

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**Assistant Director (Official  
Language)**

Mr. R. P. Uniyal

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Mrs. Valsa Pavithran  
Mr. S. S. Kocharekar  
Mrs. T. Padmavathi  
Mrs. Swati S. Parab

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Mr. G. S. Fernandes

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Mr. P. R. Ninawe  
Mrs. Pragati R. Gadre

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Mrs. N. Y. Raorane  
Mrs. Sushma Singh  
Mrs. S. R. Wadhavkar  
Mrs. D. N. Behl  
Mrs. S. V. Kadam  
Mrs. A. A. Shukla  
Mrs. D. S. Naik  
Mrs. F. G. Fernandes

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Mr. D. S. Ingale  
Mr. R. R. Kadam  
Mr. R. G. Gamare  
Mrs. S. S. Koli  
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Mrs. A. U. Joshi  
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Mrs. Sanyuja S. Parab

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Mr. P. G. Angne

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 Ms. N. A Sawant  
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 Mr. N. L. Ghane  
 Mr. Shirish P. Malvankar  
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 Mr. V. P. Tiwari  
 Mr. S. R. Jaiswar  
**S.S.Gr.III**  
 Mr. B. S. Tamankar  
 Mr. A. R. More  
 Mr. D. B. Gaikwad  
 Smt. V. J. Tambe  
**S.S.Gr .II**  
 Smt. K. R. Ahire  
 Smt. Kamla Jai Kishore  
 Mr. T. G.Gaikwad  
 Mr. J. K. Makwana  
 Mr. A. R. Dore  
 Mr. B. R. Chavan  
 Mr. M. P. Kotian  
 Mr. G. B. Kamble  
 Mr. A. R. Shingade  
 Mr. J. N. Dhanu  
 Mr. V. N. Ondkar  
**S.S.Gr.I**  
 Mr. Vinod Kumar Yadav  
 Mrs. R. H. Chavan  
 Mr. R. N. Kamble  
 Mr. A. N. Joyashi  
 Mr. G. N. Zendeekar

Mrs. Siddhi J. Kolambkar (Expired on  
 27.3.2008)

Mr. A. D. Sonawane

**Vessel Staff**

**Skipper (T - 7)**

Mr. K. Satyanarayana

**Engineer FTV (T -9)**

Mr. Josey Jacob

**Engine Driver (T -5)**

Mr. S. K. Chodankar

**Additional Engine Driver (T -6)**

Mr. S. L. Kotian

**Mate (T -4)**

Mr. S. Maity

**Deckhands (T - 2)**

Mr. K. V. Rajendran

Mr. A. P. Dhawade

**Cook**

Mr. S. Kamaraju

**S.S.Gr.IV**

Mr. B. N. Sukur

Mr. N. A. Bijali

Mr. G. G. Zendeekar

**S.S.Gr.III**

Mr. V. M. Patil

Mr. S. B. Padyal

**S.S.Gr.II**

Mr. A Lavande

**Principal Scientists**

Dr. V. K. Sharma (Officer-in-charge)

Dr. U. K. Maheshwari

**Senior Scientist**

Dr. Sudhir Raizada

**Technical Staff T-7**

Dr. M. Ali (on deputation)

**T-6**

Mr. Inderjit Singh

**T-5**

Mr. Ashok Kumar

**T-4**

Mr. Sanjeevan Kumar

Mr. Hasan Javed

**T-2**

Mr. Kishan Kumar

**Administrative Staff**

**Upper Division Clerk**

Mr. V. K. Sinha

**Supporting Staff**

**Grade-II**

Mr. Gyani Ram

Mr. Gyan Chand

Mr. Lavesh Kumar



**Principal Scientist**

Dr. G. Venugopal (Officer-in-charge)

**Scientist (Selection Grade)**

Mr. S. S. H. Razvi

**Scientist**

Dr. Sakthivel M. (Dr. M. Abbas)

**Technical Staff****T(7 -8)**

Mr. P. Rami Reddy

**T-6**

Mr. K. B. S. Murthy  
Mr. J. Krishna Prasad  
Mr. K. Murali Mohan  
Mr. P. Srinivasa Rao  
Mr. V. N. Acharyulu

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Mr. B. Krishna Rao  
Mr. R. R. S. Patnaik  
Mr. P. Satyanarayana

**T-I-3**

Mr. Y. S. Murty

**T-2**

Mr. M. Satyanarayana

**T-I**

Mr. A. Gurraiah  
Mr. K. Mallaiah

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Mr. P. V. G. Krishnamurthy  
Mr. B. Veera Raju

**Upper Division Clerk**

Mr. B. Laxman Rao

**Lower Division Clerk**

Ms. M. Rama Mani

**Supporting Staff****Grade-IV**

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Mr. M. Krishna  
Mr. M. Ch. Appa Rao  
Mr. Shivaram Kale

**Grade-III**

Mr. K. Satyanarayana  
Mr. K. Niranjan  
Mr. N. Venkata Ramana  
Mr. K. Prasad

**Grade-II**

Mr. V. Shivaji  
Mr. O. Veeraraju  
Mr. T. Satyanarayana  
Mr. P. V. K. Reddy  
Mr. P. D. Reddy  
Mr. S. Valisha  
Mr. A. L. Reddy  
Mr. S. S. Reddy  
Mr. Y. Buchilingam  
Mr. M. Govindu  
Mr. M. A. Rao  
Mr. G. V. V. Satyanarayana  
Mr. S. N. Saheb

CIFE, Kakinada Centre

**Principal Scientist**  
Dr. Somdutt (Officer-in-charge)

**Technical Staff T(7-8)**  
Mr. R. K. Upadhyay

**T-5**  
Mr. L. P. Bamalia

**T-4**  
Mr. Gurubachan Singh

**T-2**  
Mr. Anup Singh

**T-1**  
Mr. Raghuvir Prasad

**Administrative Staff**

**Assistant**  
Ms. Asha Dhurve

**Lower Division Clerk**  
Mr. Hari M. Pot pose

**Supporting Staff**

**Grade-III**  
Mr. Hari Singh  
Mr. Lallu Prasad  
Mr. Vishnu Lal  
Mr. Mangli Prasad

**Grade-II**  
Mr. Surendra Kumar  
Mr. Ram Keval Prasad  
Mr. Shambhu Dayal  
Mr. Manoharlal  
Mr. Ram Swaroop  
Mr. S. Prajapati

**CIFE, Powarkheda Centre**

**Principal Scientists**  
Dr. (Mrs.) Archana Sinha  
(Officer-in-charge)  
Dr. R. C. Das

**Senior Scientists**  
Dr. B. K. Mahapatra  
Dr. G. H. Pailan  
Dr. Shubendu Dutta

**Scientists (Selection Grade)**  
Mr. B. N. Tiwari  
Dr. P. K. Roy

**Scientists (Senior Scale)**  
Dr. Parimal Sardar

**Technical Staff**

**T(7 -8)**  
Mr. P. S. Pandey (Expired on  
19.3.2008)

**T-6**  
Mr. S. K. Sharma

**T-4**  
Mr. P. K. Patra  
Mr. R. K. Mondal

**T-3**  
Mr. S. K. Das

**T-2**  
Mr. T. K. Ghosh

**Administrative Officer**

**Personal Assistant**  
Ms. Kaberi Biswas

**Upper Division Clerk**  
Mr. C. N. Sahani  
Mr. P.K. De

**Lower Division Clerk**  
Mr. Ram Milan Singh

**Supporting Staff**

**Grade-IV**  
Mr. Bhagwat Dhar  
Mr. B. D. Mandai  
Mr. T. C. Balmiki

**Grade-III**  
Ms. Manju Paul  
Mr. R. N. Prasad  
Mr. R. N. Das  
Mr. R. Chowdhary

**CIFE, Kolkata Centre**

## Appointments

S. No.	Name	Post	Date of appointment
1.	Dr. Gopal Krishna	Principal Scientist	July 05, 2007
2.	Dr. A. K. Reddy	Sr. Scientist	July 04, 2007
3.	Dr. Ashok Kumar Jaiswar	Sr. Scientist	July 06, 2007
4.	Dr. R. S. Rana	Sr. Scientist	July 06, 2007
5.	Dr. Subodh Gupta	Sr. Scientist	July 23, 2007
6.	Dr. Chandra Prakash	Sr. Scientist	July 26, 2007
7.	Dr. S. Munilkumar	Sr. Scientist	July 30, 2007
8.	Dr. Rupam Sharma	Sr. Scientist	July 30, 2007
9.	Dr. Sumantha Kumar Mishra	Sr. Scientist	July 31, 2007
10.	Dr. Gayatri Tripathi	Sr. Scientist	August 03, 2007
11.	Dr. Satya Prakash Shukla	Sr. Scientist	August 31, 2007
12.	Dr. Swadesh Prakash	Sr. Scientist	December 07, 2007
13.	Dr. M. Sakthivel (Dr. M. Abbas)	Scientist	May 17, 2007
14.	Mr. Anil Kumar D. Kulsunge	T-3	August 10, 2007

## Promotions

S. No.	Name	Designation	Promoted as / Grant of Advance Increments	Promotion w.e.f.
1.	Dr. Somdutt	Sr. Scientist	Principal Scientist	July 01, 2005
2.	Dr. (Mrs) Kiran Dube Rawat	Sr. Scientist	Principal Scientist	February 02, 2006
3.	Dr. S. N. Ojha	Sr. Scientist	Principal Scientist	February 21, 2006
4.	Dr. (Mrs) Archana Sinha	Sr. Scientist	Principal Scientist	June 29, 2006
5.	Dr. K. V. Rajendran	Sr. Scientist	Principal Scientist	August 03, 2006
6.	Dr. G. Venkateshwarlu	Sr. Scientist	Principal Scientist	June 19, 2007
7.	Dr. R. P. Raman	Scientist (SG)	Sr. Scientist	June 16, 2006
8.	Dr. Subhendu Datta	Scientist (SS)	Sr. Scientist	April 02, 2006
9.	Dr. A. Vennila	Scientist	Scientist (SS)	August 20, 2006
10.	Dr. P. S. Ananthan	Scientist	Scientist (SS)	October 18, 2006

## Five Yearly Assessment Meeting held on 16.4.2008

11.	Mr. R. Palaniswamy	T-5	3 Adv. Increments	March 18, 2007
12.	Mrs. S. S. Gajbhiye	T-4	T-5	July 01, 2005
13.	Mr. J. M. Koli	T-4	T-5	July 01, 2005
14.	Mrs. S. P. Nalawade	T-4	T-5	January 01, 2006

### Five Yearly Assessment Meeting held on 23.4.2008

15:	Mr. Ashok Kumar	T-4	T-5	September 01, 2007
16.	Smt. Shahila Iftekhar	T-1	T-2	January 08, 2007

### Five Yearly Assessment Meeting held on 19.5.2008

17.	Mr. D. Bhoomaiah	T-5	T-6	December 04, 2005
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### Five Yearly Assessment Meeting held on 23.5.2008

18.	Dr. P. Rami Reddy	T-6	T(7-8)	January 01, 2006
19.	Mr. S. S. Kamat	T-6	T(7-8)	January 01, 2007
20.	Late Mr. P. S. Pandey	T-6	T(7-8)	January 01, 2007
21.	Dr. R. K. Upadhyay	T-6	T(7-8)	January 01, 2007
22.	Mrs. Nalini Poojary	T-5	T-6	December 17, 2006

### Five Yearly Assessment Meeting held on 26.5.2008

23.	Mr. P. K. Das	T-5	T-6	October 15, 2006
24.	Ms. Revati Dhongde	T-4	T-5	June 28, 2006
25.	Mrs. Rekha Nair	T-4	T-5	June 28, 2007

### Five Yearly Assessment Meeting held on 28.5.2008

26.	Mr. N. L. Singh	T-8	T-9	January 01, 2006
27.	Mr. Josey Jacob	T-8	T-9	January 01, 2008
28.	Mr. Gurubachan Singh	T-3	T-4	July 01, 2006
29.	Mr. K. P. Shetty	T-5	3 Adv. Increments	June 27, 2007
30.	Ms. A. Mehta	T-5	3 Adv. Increments	June 27, 2007
31.	Mrs. Swati S. Parab	Assistant	AAO.	July 03, 2007
32.	Mrs. F. G. Fernandes	U.D.C.	Assistant	July 03, 2007
33.	Mrs. Sanyuja S. Parab	L.D.C.	U.D.C.	July 03, 2007
34.	Mr. Shirish P. Malvankar	SSGr. I	L.D.C.	December 11, 2007
35.	Mr. Hari Potpose	SSGr. IV	L.D.C.	July 02, 2008
36.	Mr. Gyani Ram	SSGr. I	SSGr. II	March 19, 2008
37.	Mr. Gyan Chand	SSGr. I	SSGr. II	March 19, 2008
38.	Mr. Lavesh Kumar	SSGr. I	SSGr. II	March 19, 2008

## Assured Career Progression

S. no.	Name	Existing Scale of Pay	Up gradation Scale of Pay	Date
1.	Mr. S. Kamaraju, Cook	Rs. 4000-6000	Rs. 4500-7000	December 05, 2007
2.	Mr. Gyani Ram, SSGr.I	Rs. 2550-3200	Rs. 2610-3540	August 30, 2007
3.	Mr. Gyan Chand, SSGr.I	Rs. 2550-3200	Rs. 2610-3540	August 30, 2007
4.	Mr. Lavesh Kumar, SSGr.I	Rs. 2550-3200	Rs. 2 610-3540	August 30, 2007

## Transfers

S. No.	Name	Designation	From	To
1.	Dr. V. K. Sharma	Principal Scientist	CIFRI, Karnal Centre	CIFE Rohtak Centre
2.	Dr. P. K. Ghosh	Principal Scientist	CIFE Kolkata Centre	CIFE, Mumbai
3.	Dr. N. K. Chadha	Sr. Scientist	CIFE Rohtak Centre	CIFE, Mumbai
4.	Dr. G. H. Pailan	Sr. Scientist	IGFRI, Jhansi	CIFE Kolkata Centre
5.	Dr. B. K. Mahapatra	Sr. Scientist	ICAR Research Complex for NEH Region, Barapani	CIFE Kolkata Centre
6.	Mr. S. S. H. Razvi	Scientist (SG)	CIFE Powarkheda Centre	CIFE Kakinada Centre
7.	Mr. P. Satyanarayana	T-5	CIFE Lucknow Centre	CIFE Kakinada Centre
8.	Dr. Sakthivel M. (Abbas M.)	Scientist	CIFE, Mumbai	CIFE Kakinada Centre
9.	Mrs. Vidya Shree Bharati	Scientist	IISS, Bhopal	CIFE, Mumbai
10.	Mr. Chironji Lal	Chief A. O.	CIFE, Mumbai	IVRI, Izatnagar
11.	Mr. Suresh Kumar	Sr. A. O.	NBPGR, New Delhi	CIFE, Mumbai

## Deputation

Name & Designation	From	Date of Relieving	Deputation to
Dr. M. Ali, T-7	CIFE Rohtak Centre	03.10.2006 (3 years)	Department of Animal Husbandry, Dairying & Fisheries, Krishi Bhavan, New Delhi
Mrs. Zeba Jaffer Abidi, T-6	CIFE, Mumbai	11.09.2006 (2 years)	Water Restructuring Project, Lucknow



## Foreign Visits

Name & Designation	Deputation Period	Place of visit	Purpose
Dr. Dilip Kumar, Director	May 29, 2007	Oslo, Norway	Workshop relating to Indo-Norwegian Project.
Dr. S .D. Singh, Principal Scientist	September 01- 08, 2007	San Francisco, USA	Participation in the "137 <sup>th</sup> Annual Meeting of International Fisheries Session".
Dr. U. K. Maheshwari Principal Scientist	October 11-29, 2007	Galilee College, Israel	Training Programme on "Intensive Fish Cultivation Management Programme"

## Retirements

Name	Designation	Retired on	Place of posting
Mr. T. D. Kumar (Voluntary Retirement)	A. A. O.	May 29, 2007	CIFE, Mumbai
Mr. D. L. Sawant	T-5	May 31, 2007	CIFE, Mumbai
Mr. P. Satyanarayana	T-5	June 30, 2007	CIFE Kakinada Centre
Mr. N. A. Bijali (Voluntary Retirement)	S.S.Gr. IV	August 01, 2007	CIFE, Mumbai
Mr. K. Satyanarayana	S.S.Gr. III	August 31, 2007	CIFE Kakinada Centre
Mr. K. P. Khalsa	T-5	August 31, 2007	CIFE, Mumbai
Dr. P. P. Joshi	Principal Scientist	February 29, 2008	CIFE Rohtak Centre

## Demise

Name	Designation	Expired on	Place of Posting
Mr. P. S. Pandey	T-7-8	March 19, 2008	CIFE Kolkata Centre
Mrs. Sidhi J. Kolambkar	S.S.Gr. I	March 27, 2008	CIFE, Mumbai



# 15.कार्यकारी सारांश

केन्द्रीय मात्स्यिकी शिक्षा संस्थान, मुंबई की वर्ष 2007-2008 की अवधि की प्रगति संतोषजनक रही। योजनानुसार इस वर्ष संस्थान की 20 संस्थागत अनुसंधान परियोजनाएँ, 23 बाहरी परियोजनाएँ, 2 अंतरराष्ट्रीय परियोजनाएँ एवं 2 अनुबंधित शोध परियोजनाएँ कार्यरत हैं। हरियाणा के अतःस्थलीय क्षारीय जल में टाइगर झींगा (पीनियस मोनाँडान) की जीवितता का दर टेक्नो-आर्थिकी संभावना के अनुसार प्रगति पर है। हरियाणा के क्षारीय प्रभावित तालाबों में नाइट्रोजन एवं फास्फोरस का स्तर काफी कम है। देशी बेकटीरिया के प्रभाव को कम करने व उपजाऊपन को बढ़ाने हेतु जैविक खाद का उपयोग किया गया। महाराष्ट्र के लवणीय प्रभावित क्षेत्र में सल्फेट की अधिकता को समाप्त करने हेतु अनुपातिक रसायन एवं पो-षक तत्वों की उपलब्धता दर्शाई गई। मैक्रोबेकियम रोजनबर्गी के नोडा वायरस प्रभाव को अवरुद्ध करने हेतु 8 नए माडल जोड़ों का निर्माण किया गया। मै. रोजनबर्गी के अनियंत्रित भण्डार एवं प्रोटीन आहार के स्तर का अ'ययन करते हुए यह पाया गया कि उच्च हिमोलिम्फ ग्लूकोज में, उच्च प्रोटीन फेड ग्रुप था, जबकि संचित आहार में इस प्रकार का प्रभाव नहीं देखा गया। उच्च प्रोटीन फेड ग्रुप में उच्चतम श्वसन फैलाव क्रिया (एन वी टी) को रिकॉर्ड किया गया। महाराष्ट्र के डिम्बे जलाशय में हरित खाद प्लांटेशन की से जलाशय में उत्पादकता की बढ़ोत्तरी पाई गई।

भारतीय मात्स्यिकी एवं जलकृषि संबंधी एक सुदृढ़ नीति को कार्यरूप देने हेतु गुवाहाटी, हैदराबाद, गोवा, चंडीगढ़ एवं पटना में पांच क्षेत्रीय कार्यशालाएं आयोजित की गईं। इन सभी कार्यशालाओं की कार्यवाही का विस्तृत विवरण दर्शाते हुए एक बुलेटिन प्रकाशित कर सभी संबंधित संस्थाओं व योजनाकर्ताओं को भेजी गई। पेटेन्ट्स एवं पेटेन्ट्स संबंधी अनुभवों का अ'ययन किया गया तथा पेटेन्ट्स हेतु मात्स्यिकी संबंधी 151 क्षेत्रों का चयन कर उनका प्रलेख उपलब्ध कराया गया। इस संस्थान ने भोज्य हेतु कई मत्स्य पदार्थों जैसे सैंडविच पेस्ट, पाउच में फिश करी एवं विभिन्न विधियों का निर्माण किया।

शैक्षणिक क्षेत्र के अंतर्गत 16 छात्रों ने पी.एच.डी. की उपाधि प्राप्त की तथा 36 छात्रों ने एम.एफ.एस.सी. डिग्री तथा 22 छात्रों ने पोस्ट ग्रेजुएट डिप्लोमा प्राप्त किया। इस वर्ष कुल 92 छात्रों को प्रवेश दिया गया, जिनमें से 25 छात्रों को पी.एच.डी., 45 छात्रों को एम.एफ.एस.सी. व 22 छात्रों को अन्तःस्थलीय मात्स्यिकी में स्नातकोत्तर स्तर की उपाधि हेतु प्रवेश दिया गया।

इस अवधि में विस्तार कार्यक्रमों में भी काफी प्रगति की गई। उपकेन्द्रों में 59 अल्पकालीन प्रशिक्षण कार्यक्रम आयोजित किए गए। इन प्रशिक्षण कार्यक्रमों में 1284 छात्रों को प्रशिक्षण दिया गया। संस्थान ने भारत के विभिन्न क्षेत्रों में आयोजित 22 प्रदर्शनियों में भाग लिया। संस्थान के कर्मचारियों ने विभिन्न विषयों पर चार रेडियो वार्ताएं प्रसारित की। संस्थान की गतिविधियों को दूरदर्शन एवं समाचार पत्रों में व्यापक रूप से प्रचारित - प्रसारित किया गया। संस्थान के वैज्ञानिकों ने मत्स्य कृषकों एवं जिज्ञासुओं को विभिन्न स्तर का मार्गदर्शन दिया। संस्थान के मुख्यालय एवं उपकेन्द्रों में मछुआरा दिवस मनाया गया। विभिन्न विद्यालयों, संस्थानों आदि के 1343 छात्रों को संस्थान के मुख्यालय एवं उपकेन्द्रों की गतिविधियों से अवगत कराया गया। प्रौद्योगिकी का हस्तांतरण एवं जलकृषि विस्तार रणनीति की नवीनता व पहुंच का प्रदर्शन त्रिपुरा, मणीपुर, मिजोरम, असम एवं नागालैंड के उत्तर-पूर्वी राज्यों में किया गया। इसी के साथ इस संस्थान के वैज्ञानिकों ने इसी वर्ष में तकनीकी का सफल प्रदर्शन किया। इस संस्थान ने उत्तर-पूर्वी राज्यों में 35 प्रशिक्षण कार्यक्रम आयोजित किए। कटकटी आदिवासियों के जीवन निर्वाह हेतु डिम्बे जलाशय फिशरटाक मीट आयोजित किया गया। इसी के साथ संस्थान के दो जलयानों एम.एफ.वी. सरस्वती एवं एम.एफ.वी. नर्मदा से 20 समुद्रीय अ'ययन कार्यक्रम आयोजित किये गये।

इस वर्ष संस्थान के संयुक्त निदेशक डा. सुभाष चन्द्र मुखर्जी ने राजीव गांधी फाउंडेशन से राजीव गांधी सद्भावना अवार्ड प्राप्त किया। डा. बी. के. महापात्रा, वरिष्ठ वैज्ञानिक को जूलोजिकल सोसाइटी एवं इंग्लैंड फिशरीज सोसाइटी आफ इंडिया का फैलोशिप प्राप्त हुआ। डा. परिमल सरदार, वैज्ञानिक एस.एस. को एनिमल न्यूट्रीशन सोसाइटी आफ इण्डिया का बेस्ट पेपर प्रजेंटेशन अवार्ड व डा. एस.डी. सिंह, प्रधान वैज्ञानिक को अमेरिकन फिशरीज सोसाइटी की अंतरराष्ट्रीय सदस्यता प्राप्त हुई एवं आई एफ एम / ए एफ एस, अमेरिका से भी आर. सुलियन अंतरराष्ट्रीय ऐण्डोवमेंट फण्ड फैलोशिप प्राप्त हुआ। इसी के साथ डा. सिंह को अमेरिका जाने हेतु भारत सरकार से आई.एन.एस.ए. व डी.बी.टी अंतरराष्ट्रीय ट्रेवल फैलोशिप प्राप्त हुआ। डा. कमल कांत जैन, प्रधान वैज्ञानिक एवं डा.(श्रीमती) लता शेनाय, वरिष्ठ वैज्ञानिक को एकेडमी आफ साइंस, इंजिनियरिंग एवं टेक्नालाजी, भोपाल की फैलोशिप प्राप्त हुई। डा. ए.के.पाल, प्रधान वैज्ञानिक का चयन नेशनल एकेडमी आफ एग्रीकल्चर साइंस (नास), नई दिल्ली हेतु हुआ। डा. एस. जाधव, वैज्ञानिक, एकेडमी आफ एग्रीकल्चर साइंस (नास), नई दिल्ली में एक असोसिएट के रूप में चयनित किए गए।

इस अवधि में संस्थान के वैज्ञानिकों के 52 शोध पत्रक विभिन्न पत्रिकाओं में प्रकाशित हुए। इसी के साथ 16 लोकप्रिय लेख, 84 सारांश, 8 पुस्तकों के पाठ, 4 प्रशिक्षण मैनुअलस एवं 7 पुस्तकें/तकनीकी बुलेटिन/ब्रोशर आदि प्रकाशित हुए।

संस्थान के वैज्ञानिकों ने 60 कार्यशालाओं/संगोष्ठियों/सम्मेलनों व कांग्रेस में भाग लिया। इसी के साथ, संस्थान के वैज्ञानिकों ने 17 प्रशिक्षण कार्यक्रम /शीत स्कूल/ग्रीष्म स्कूल व बौद्धिक मंथन में भाग लिया। संस्थान ने विभिन्न विषयों पर 17 बैठकों, 9 कार्यशालाओं एवं 3 सी.ए.एस. कार्यक्रमों का सफल आयोजन किया।

संस्थान में शोध सलाहकार समिति (आर.ए.सी.), प्रबंध मंडल, शैक्षणिक परिषद्, विस्तार परिषद् एवं कार्यान्वयन समिति की बैठकें नियमित रूप से संचालित की गईं।