CIFE
Annual Report 2011-12

Central Institute of Fisheries Education
(University under section 3 of UGC act)
Panch Marg, Off Yari Road, Andheri (W), Mumbai - 400061

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Preface

The Central Institute of Fisheries Education is surging ahead to provide educational and scientific support for enhancing and sustaining fish production in the country and thereby assuring food and nutritional security to the growing Indian population. From its modest beginning as a training centre of Government of India supported by FAO and UNDP in 1961, to impart training and education to the in-service personnel and finally as a Central Institute and University under sec 3 of UGC act, CIFE has marched significantly ahead and celebrated its Golden Jubilee this year in a befitting manner with a number of events like mini symposia, farmer-scientist interface, golden jubilee seminars, national stake-holders consultation, national dialogue on nanotechnology etc.

This report presents comprehensive information on the various activities and achievements of the institute during the year 2011-12. CIFE, as a professional organization, values and recognizes the dedication and contribution of every individual in the system. The Institute promotes and cultivates innovative ideas in all spheres of its activities. The institute has taken initiatives in the diversified but focused research areas. Our scientists are attracting funds from national organizations as is evident from the wide portfolio of externally funded and collaborative research projects operating at the institute. The institute received active support from various agencies such as NAIP, NFDB, DBT, BRNS (DAE), Ministry of Earth Sciences (MoES), INCOIS, SAC, and NFBSFARA.

The institute has achieved significant success in many of the basic, strategic and

applied research programmes this year. The scientists could prove the viability of shrimp culture in inland saline waters on a commercial scale, and this is going to help the farmers in the salt-affected areas for better livelihood, resource generation and employment. The institute has also developed a successful model of sustainable enhancement of productivity of reservoirs through community participation in Dimbhe reservoir, Maharashtra. In the area of applied research, development of biosensors for monitoring of genotoxic pollutants, bio-processing of agricultural wastes and bioremediation of aquacultural effluents, DNA vaccine delivery through nanoparticles, development of value-added fish products are worth mentioning. The institute is also in the forefront of conducting research in molecular phylogeny and bar coding, bio-prospecting of genes, gene silencing as strategy to manage diseases, radio-ecology, characterization of genes responsible for growth and immunity

and development of high throughput disease diagnostic tools. Further, institute involves and progresses in new research frontiers through students' research in diversified areas.

During the year, 20 Ph. D. students and 68 M. F. Sc. students have passed out while 49 Ph. D. students and 73 M. F. Sc students are enrolled in various disciplines. Twenty students were awarded gold medals during the Xth convocation. A total of 108 students participated in 9th Indian Fisheries forum held at Chennai and two students attended an International Advanced Course in Spain. The institute has published 80 research papers in peer-reviewed journals, contributed 23 chapters to books and 10 popular articles to national magazines. Five books were published by the scientists of the institute. Concerted efforts are underway to formulate a road map for higher fisheries education & research in the coming year.

The institute is moving forward with a well planned strategy with dedication and commitment to the cause of education and research in Aquaculture and Fisheries; there are clear signs of emerging excellence in education as well as scientific research. I am deeply indebted to the Secretary, DARE and Director General, ICAR, Dr. S. Ayyappan for his visionary guidance and support to this Institute. We thankfully acknowledge the support and co-operation from Dr. B. Meenakumari, Deputy Director General (Fy.), Dr. S.D. Singh, ADG (Inland Fisheries), Dr. Madan Mohan, ADG (Marine Fisheries) and all other colleagues from the fisheries division.

I am grateful to the Members of Board of Management, Chairman and Members of Research Advisory Committee, Members of Academic Council, Extension Council, Heads of Divisions, Board of Examiners and other Institute level committees for their co-operation and support. I thank the Directors and scientists of all the Fisheries Institutes, Guest Faculty and External Examiners for their timely support. I acknowledge the contributions of all the scientists, technical and administrative staff and students of CIFE. My compliments to the publication team for bringing out this annual report.

(W.S.Lakra)

2 Executive Summary

During the current year, the Central Institute of Fisheries Education continued to contribute significantly with focus on education, research and extension. The year started with the Xth Convocation with Dr. M.S. Swaminathan, Hon'ble Member of Parliament and Chairman, M.S. Swaminathan Research Foundation, Chennai as Chief Guest and Dr. Anil Kakodkar, Chairman, Rajiv Gandhi Science & Technology Commission as Guest of Honour. A total of 86 masters and 29 doctoral degrees were awarded and 20 gold medals were presented to outstanding students in various disciplines. As in previous year, this year too, 16 posts of Agricultural Research Service were bagged by our students. Two students were awarded the Best Young Scientist Award by Altech Inc. USA, one student bagged Best Research Paper Award and two students were awarded Best Poster Presentation award in two different International Conferences. During the year, 49 Ph.D. students and 73 M.F.Sc. students were enrolled in various disciplines.

The Golden Jubilee function was indeed a remarkable occasion with an year-long commemorative functions which culminated on 6 June 2011 and was attended by a galaxy of dignitaries. The institute recorded many memorable achievements during the year adding colour and glitter to the Golden Jubilee celebration. Several mini symposia were held and a workshop on Higher Fisheries Education and Human Resource Planning was organised to mark the culmination of Golden Jubilee celebrations.

Significant research achievement, in the form of new information and upscaling of technologies and tools for sustainable aquaculture and fisheries production, were made in 25 institutional and 24 externally funded projects. The institute focused its attention on diversification of species for aquaculture, reservoir development through community participation, testing the viability of *Litopenaeus vannamei* culture, molecular phylogeny, DNA barcoding, bioprocessing of agricultural wastes, bioremediations of aquaculture effluents, development of DNA-vaccines, development of biosensors for monitoring of genotoxic pollutants, gene silencing and radio-ecology. Other areas where significant progress was made include molecular characterization of growth hormone gene of *Pangasianodon hypophthalmus*, assessment of impact of juvenile fishery on fish production along the west coast of India, development of salt-fermentation method for Indian Mackerel, culture of *Fenneropenaeus indicus* and *Penaeus monodon* in inland salt-affected area, bioprospecting of genes responsible for abiotic stress-tolerance, development of quantitative real- time PCR for shrimp viruses, effect of degradation products of both nutrients and anti-nutrients of aquafeed on immune physiology of fish are the other areas where significant advancements were made. Strengthening of digital library and information management was also a focus area of the institute.

The institute organized various extension education/transfer of technology related programmes and activities. A total of 60 short-term training programmes were organized at the headquarter and the four research centres in which 1142 participants were imparted skill in various aspects of aquaculture. The institute actively

participated in 19 exhibitions and kisan melas, at various places across the country showcasing the achievements and services being provided to the fishermen community. The institute organized 18 workshops, conferences and 12 meetings. The faculty attended 72 workshops/symposia/meetings etc. and 27 summer schools/winter schools/ training programmes. Sixteen guest lectures were given by the faculty at various universities.

A total of 80 research papers were published in refereed journals with high impact factor. Apart from this, a number of review papers, popular articles, books, book chapters and bulletins were also published during the year. The meetings of IRC, RAC, BoM, Academic Council and Extension Council were held as per schedule.

The infrastructure development of the institute is being carried out at fast pace. The infrastructure developed in this financial year include, Academic building (3rd and 4th Floor), Boys' Hostel (Stilt + 4 Floors), International Guest House (Stilt + 4 Floors), Residential quarters (Type – V: 12 Nos. Stilt + 4 Floors) and Director's Residence.

The institute also received a number of awards and recognitions during the period. Dr. W. S. Lakra, Director/Vice-chancellor, was honoured with *Vividhlaxi Audyogik Samshodhan Vikas Kendra* Industrial Research Award (VASVIK) in the category of Agricultural Science & Technology from the Hon'ble Chief Minister of Gujarat, for his outstanding contribution in Agricultural Science & Technology. He was also honoured with Dr. S. Z. Qasim Medal by Bioved Research Society. Dr. K. V. Rajendran, Principal Scientist, was awarded the Fulbright-Nehru Senior Research Scholarship by the United States-India Educational Foundation for the year 2010-11. Dr. S. Dam Roy, Head, Aquaculture Division received Dr. Rajendra Prasad award 2010 for his book in Hindi entitled *"North Bay Andaman Munga Chattano Ke Jaiva Vividhita"* under the category technical book in Hindi in Agricultural and allied sciences. Mr. Dasari Bhoomaiah, Technical Officer, PME Cell was honoured with "Outstanding Services to ICAR" award by DG, ICAR, New Delhi and as "Volunteer-Designer" by Aquaculture without Frontiers, USA for his outstanding contributions to the organization. Dr. M. Krishnan, Head, FEES Division was elected unanimously as Member of Editorial Board of the Journal, Agricultural Economics Research Review, New Delhi. Dr. A.K. Pal, Head, FNBP Division was nominated as the Member, Expert Committee constituted by Govt. of India for Kudamkulam Nuclear Power Station. Dr. V.K. Tiwari was honoured with the Prof.B.N. Pandey, Gold Medal by Zoological Society of India. Several scientists also received best research paper and best poster presentation awards.

3 Introduction

The Central Institute of Fisheries Education is a premier institution in fisheries education and training in the country which has completed 50 glorious years of its existence in the service of the nation. It was established on 6th June, 1961 with FAO/ UNDP assistance to impart training to the officers of State Department of Fisheries as a Government of India organization. The Administrative control of the institute was transferred to Indian Council of Agricultural Research (ICAR), New Delhi, in 1979. The institute was accorded Deemed to be University status in 1989, by the Ministry of Human Resource Development, Government of India. It offers master and doctoral programs in 11 disciplines of fisheries and aquaculture. Initially, CIFE was housed in the Institute of Science, Bombay, and in 1964, it was shifted to a rented building at Masjid Bunder, Bombay. However, in March 1967, the Institute moved to an independent campus at Seven Bungalows, Versova, in the western Suburbs of Bombay. Presently, it is housed in the newly developed serene and expansive Yari Road Campus. It has a B+G+4 Academic Building that houses state-of-the-art laboratories, class rooms, faculty and staff chambers, chambers of the Director and Joint Director, conference hall, community hall, aquarium, examination and academic cell, etc. Apart from wet-laboratories, ponds and hatcheries, library building, staff quarters, guest house and students' hostels, CIFE also possess two training-cum-research vessels, MFV Saraswati and MFV Narmada.

There are six divisions at CIFE at present, which are equipped with modern laboratories, seven sections and 12 cells. Apart from the headquarters in Mumbai, the institute has four centers located in different aqua-climatic regions of the country viz., Kakinada in Andhra Pradesh, Kolkata in West Bengal, Powarkheda in Madhya Pradesh and Rohtak in Haryana, with farms and infrastructural facilities for imparting hands-on training to students, farmers, entrepreneurs and development personnel. The freshwater, brackishwater and inland saline water farm facilities at these centers help to conduct the field trials and to test and standardize the technologies developed in the laboratories.

Main emphasis of the institute is on basic and strategic research through faculty and students' research. Need-based training programmes, professional development programmes and entrepreneurship development programmes are conducted to cater to the needs of the sector. The institute has been playing a key role in promoting excellence in higher education through revision of syllabi, state-of-the-art

laboratories and farm facilities and innovative teaching methods.

A total of 145 doctoral and 739 post-graduate students have successfully graduated from this university since 2000. It has also successfully trained more than 5200 personnel till date through two years PG Diploma in Fisheries Science, one year Diploma in Fisheries Science and one year Diploma/Certificate courses. CIFE alumni, today are either illustrious scholars or successful entrepreneurs who occupy top management positions in their respective organizations. Through its tailor-made and need-based short-term training programmes more than 600 fisheries personnel, farmers, prospective aqua-entrepreneurs and the industry personnel are trained every year. CIFE as a leader in fisheries education in India is helping to standardize and maintain uniformity in the curriculum of fisheries education in the country. The deemed University has also published quality study materials, reference books and practical manuals useful for students, trainees and faculty members. The Institute has been identified as one of the top 20 'Bright Spots' in the country by Tandon Committee constituted by Ministry of Human Resource Development, Govt. of India to assess the performance of Deemed Universities in the country.

CIFE was instrumental in bringing about Blue Revolution in India in general and Andhra Pradesh in particular through its extension and training programs conducted at the freshwater and brackishwater demonstration farms situated at various centers, especially Kakinada Centre. Through its 'Farmers First' policy, CIFE in collaboration with various State Fisheries Departments is conducting a number of training programmes for fish farmers at various locations including its centers. The institute has conducted several training programs for women and has helped them to organize the cooperative societies for manufacturing and marketing the value-added fish products. CIFE has been playing a significant role in developing aquaculture specially the high-value freshwater prawn culture in the North Eastern States of Tripura, Mizoram and Manipur by setting up hatcheries using artificial sea water. The institute has initiated several programmes in collaboration with Departments of Fisheries of different states for capacity building of extension personnel and other stakeholders in the areas of participatory and cost-effective extension services and fisheries co-management. CIFE maintains close linkages with various national and international organizations and agencies for ensuring quality education and research.

Vision

To be a world-class organization providing leadership in fisheries education and research

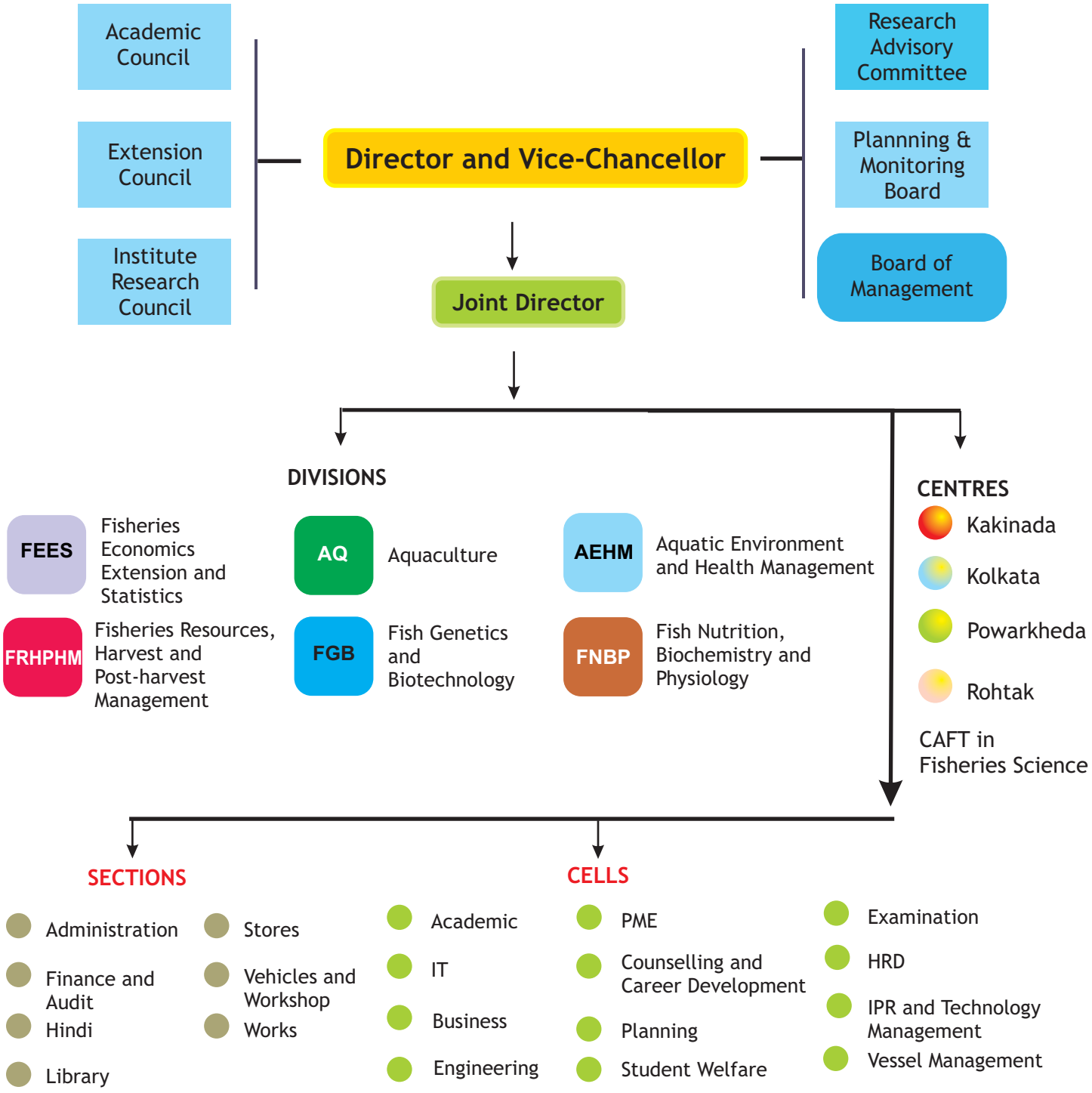
Mission

To achieve academic and research excellence by creating state-of-the-art infrastructure and globally competitive faculty

Mandate

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

Organization and Management



Staff Position

	CIFE Staff	Sanctioned	In Position
Category wise	RMP	2	2
	Scientific	104	71
	Technical	106	97
	Administrative	63	49
	Skilled Supporting	70	68
	Non Ministrial	01	01
	Total	346	288

Budget (Rs. in Lakhs)

S. No.	Head	Sanctioned	Received	Expenditure Incurred
1.	Plan	3576.30	3576.70	3373.71
2.	Non-plan	3684.69	3546.00	3451.62
3.	CAFT	10.35	10.21	0.42
4.	SDU	285.65	275.12	276.26

S.No.	Head	Balance C/f	Receipt in this year	Total
1.	AP Cess	4.98	-	4.98
2.	Externally Funded Projects	737.71	140.93	878.64

Target: 162 **Achieved:** 245.83

4 Educational Achievements

Results

A total of 20 Ph.D. students and 68 M.F.Sc students from various disciplines passed out during 2010-11

S.No.	Name of the Programme	No. of successful candidates
	Ph.D.	
1	Aquaculture	5
2	Fisheries Resource Management	2
3	Post Harvest Technology	2
4	Fish Genetics	1
5	Fish Pathology & Microbiology	4
6	Fish Nutrition & Biochemistry	2
7	Fish Business Management	1
8	Fish Biotechnology	1
9	Mariculture	1
10	Inland Aquaculture	1
	Total	**20**
	M.F.Sc. (2009-11)	
1	Aquaculture	11
2	Fisheries Resource Management	8
3	Post Harvest Technology	8
4	Fish Genetics and Breeding	9
5	Fish Pathology & Microbiology	8
6	Fish Nutrition & Biochemistry	8
7	Fish Business Management	5
8	Fisheries Extension	5
9	Aquatic Environment Management	6
	Total	**68**

Enrollments

A total of 73 and 49 students were enrolled for the M.F.Sc. (2011-2013) and Ph.D. Programmes (2011-14) in various disciplines, respectively. Three foreign students (Eritrea) were enrolled for M.F.Sc and 1 foreign student (Eritrea) was enrolled for Ph.D.

S.No.	Name of the Programme	No. of Candidates enrolled
	Ph.D (Batch-2011-2014)	
1	Aquaculture	12
2	Fisheries Resource Management	8
3	Post Harvest Technology	5
4	Fish Genetics	2
5	Aquatic Animal Health	5
6	Fish Physiology and Biochemistry	2
7	Fish Business Management	3
8	Fish Biotechnology	5
9	Fish Nutrition and Feed Technology	2
10	Fisheries Extension	3
11	Aquatic Environment Management	2
	Total	**49**
	M.F.Sc. (Batch-2011-13)	
1	Aquaculture	13
2	Fisheries Resource Management	8
3	Post Harvest Technology	9
4	Fish Genetics and Breeding	4
5	Fish Biotechnology	4
6	Aquatic Animal Health	8
7	Fish Physiology & Biochemistry	4
8	Fish Nutrition and Feed Technology	4
9	Fisheries Economics	7
10	Fisheries Extension	6
11	Aquatic Environment Management	6
	Total	**73**

List of Dissertations submitted by M.F.Sc.(2009-11 batch) students

Sr.No.	Name of the student	Guide	Topic
Aquatic Environment Management - AEM			
1	Mr. Mallesh B. AEM-08	P.K. Pandey	Assessment of chromium genotoxicity in *Cirrhina mrigala* using micronucleus assay
2	Mr. Ratheesh Kumar R. AEM-09	C.S.Purushothaman	A comparative study of biodiversity between Powai and Virar lakes in Mumbai
3	Mr. Sandeep K.P. AEM-10	S.P. Shukla	Utilization of seawater and inland saline water for the production of *Spirulina platensis*
4	Ms. Rathi Bhuvaneswari G. AEM-11	S.P. Shukla	Antimicrobial properties of *Spirulina platensis* : An assessment
5	Mr. Thirumalaiselvan S. AEM-12	P.K. Pandey	Bioremediation of fipronil in aquatic environment
6	Ms. Manju Lekshmi N. AEM-13	A. Vennila	Nutrient and enzyme dynamics during leaf litter decomposition of *Acanthus ilicifolius* and *Avicennai marine* in Manori creek, Maharashtra
Aquaculture -AQ			
1	Mr. Atish M. Mane AQ-235	Kiran Dube Rawat	Growth, survival and production of carps fingerlings under different stocking densities in cages and pens in dimbhe reservoir, Maharashtra
2	Mr. Amiya Ranjan Naik AQ-236	Chandra Prakash	Comparative studies on potency and cost effectiveness of zeolite, alum and lime in aquaculture systems
3	Ms. Pragyan Dash AQ-237	Kiran Dube Rawat	Changes in ovarian activity and vitellogenin level under different acclimation of temperature
4	Ms. Prasanti Nayak AQ-238	S. Dam Roy	A comparison of growth and colouration of *Carassius auratus* (Linnaeus, 1758) under different culture systems
5	Ms. Upasana Mishra AQ-239	S. Dam Roy	Effect of EPA/DHA enriched live feed on growth and fatty acid profile of Mahaseer, *Tor khudree* (Sykes, 1839) Fry

6	Amar Bharat Gaikwad AQ-240	N.K. Chadha	Studies on rearing of *Lates calcarifer* (Bloch 1790) fry using live and formulated feed
7	Mr. Vivek Shrivastava AQ-241	A.K. Verma	Optimization of design of a trickling biofilter in closed recirculating system for growth performance of Rohu fingerlings
8	Ms. Jesna P.K. AQ-242	Neelam Saharan	Comparative study of probiotics on water quality, growth and immune response in *Labeo rohita* (Ham.)
9	Mr. Jeston N. AQ-243	V.K. Tiwari	Growth performance and maturation in *Macrobrachium rosenbergii* (de Man, 1879) fed with Methyl farnesoate enriched diet
10	Mr. Anuraj A. AQ-244	V.K. Tiwari	Evaluation of bacterial microflora associated with giant freshwater prawn, *Macrobrachium rosenbergii* (de Man, 1879) hatchery
11	Ms. Amruta Prakash Shete AQ-245	M.P. Singh Kohli	Production performance of Goldfish (*Carasius auratus, Linnaeus, 1758)*
Fisheries Extension - FEX			
1	Mr. Dusu Nobin FEX-10	S.N. Ojha	Livelihood, culture and innovation in paddy cum fish farming system in Apatani plateau of Arunachal Pradesh
2	Mr. Nikumbe Prabhakar A. FEX-11	Ananthan P.S.	Study of fishers' livelihood and fisheries management in Girna, Yedgaon and Manikdoh reservoir regions in Maharashtra
3	Mr. Zohmingthanga FEX-13	Ananthan P.S.	A socio-cultural study of indigenous people and indigenous knowledge in fisheries of Mizoram
4	Ms. S. Agnes D. Angela FEX-14	Sheela Immanuel	Study of fishers' livelihood and fisheries management in Stanley reservoir in Salem district of Tamilnadu
5	Mr. Kundan Kumar FEX-15	S.N. Ojha	Study on property regime and livelihood in the Bheri fish farming system of Kolkata peri-urban areas, West Bengal

Fish Pathology & Microbiology - FPM

1	Mr. Nich Tain FPM-43	Gayatri Tripathi	Response of branchial Na^+, K^+- ATPase activity during osmotic adjustments in euryhaline fish *Etroplus suratensis*
2	Ms. Reshma K J. FPM-44	K.V. Rajendran	Comparative evaluation of latency - associated genes of white spot syndrome virus (WSSV) for developing PCR test to detect latent infection
3	Ms. Greeshma S.S. FPM-45	K.V. Rajendran	Non-specific effect of DNA construct (pCMV-GFP-LH) on the expression of prophenoloxidase (proPO) and ferritin genes of *Penaeus monodon*
4	Ms. Snatashree Mohanty FPM-46	M. Makesh	Development and characterization of monoclonal antibodies to immunoglobulin of *Cirrhinus cirrhosus*
5	Mr. Arun Sudhagar S. FPM-47	K. Pani Prasad	Characterization of Immunoglobulin in *Pangasianodon hypophthalmus* (Sauvage)
6	Ms. Jeena K. FPM-48	K. Pani Prasad	Expression profiling of WSSV ORF-249 and shrimp Ubiquitin conjugating enzyme in WSSV infected *Penaeus monodon*
7	Mr. Saurav Kumar FPM-49	R.P. Raman	Immunododulatory and antiparasitic effects of Azadirachtin against some selected Ectoparasites in goldfish (*Carassius auratus)*
8	Mr. Abhay Kumar FPM-50	R.P. Raman	Immunomodulatory and antiparasitic effects of piperin against some selected ectoparasites in goldfish (*Carassius auratus*)

Fisheries Resource Management - FRM

1	Mr. Gaihiamngam Kamei FRM-216	S.K.Chakraborty	Study of damage caused by capture of juvenile sciaenids
2	Mr. Jeetendra Kumar FRM-217	G. Deshmukhe	Biodiversity and density of microalgae along intertidal zone in post monsoon and pre-monosoon season along Mumbai coast
3	Ms. Rejani Chandran FRM-218	A.K. Jaiswar	A study on the recruitment potential of *Boleophthalmus* spp.

4	Mr. Sreekanth G.B. FRM-219	S.K. Chakraborty	Stock structure analysis of Japanese thread fin bream, *Nemipterus japonicus* (Bloch, 1791) along Indian coast
5	Mr. Rajesh Kumar Pradhan FRM-220	V.D. Deshmukh	Biology and length-weight relationship of *Ilisha filigera* (Valenciennes, 1847) in Mumbai waters
6	Mr. Ambarish P. Gop FRM-221	G. Deshmukhe	Effects of light intensity and macronutrients on the growth and phycocolloid content of *Kappaphycus alvarezii* (Doty) Doty ex Silva
7	Ms. Surya S. FRM-222	Asha T. Landge	Study of trophic relationship in the aquatic community of lake Powai, Mumbai
8	Ms. Suman Kumari FRM-223	A.K. Jaiswar	Taxonomic study of family sciaenidae
Fish Genetics & Breeding - FGB			
1	Mr. Makwana Nayan P. FGB-42	Gopal Krishna	Cryopreservation of rainbow trout, (*Oncorhynchus mykiss)* spermatozoa using different cryoprotectants
2	Mr. Uday Kumar Udit FGB-43	A.K. Reddy	Breeding and genetic characterization of *Puntius* sp.
3	Mr. Avinash Rambhau Rasal FGB-44	R.S. Rana	Molecular and functional characterization of Δ6 fatty acyl desaturase gene from *Pangasinodon hypophthalmus*
4	Ms. Rakha M.U. FGB-45	Aparna Chaudhari	Promoter sequencing of sodium potassium ATPase of *Penaeus monodon* using genome walking
5	Mr. Kiran Dashrath Rasal FGB-46	Aparna Chaudhari	Detection of integration site of transgene in Zebra fish (*Danio rerio)* genome by using Inverse polymerase chain reaction (IPCR)
6	Mr. Mujahid Khan A.P. FGB-47	Gopal Krishna	Therapeutic role of a recombinant *Penaeus monodon* antiviral (rPm AV) against WSSV in *Penaeus monodon*
7	Mr. Murali S. FGB-48	S. Jahageerdar	*In Silico* approaches for characterization of stress responsive genes in zebrafish
8	Ms. V.L.Ramya FGB-49	Rupam Sharma	Development of polymer based DNA nano-vaccine against Nodavirus

Fish Nutrition & Biochemistry - FNB

1	Mr. Nagung Camder Tok FNB-42	K.K. Jain	Growth response of *Pangasianodon hypophthalmus* (Sauvage, 1878), to restricted protein feeding
2	Mr. Sikendra Kumar FNB-43	S. Munilkumar	Dietary intervention for improving flesh quality in *Pangasianodon hypophthalmus* (Sauvage, 1878)
3	Ms. Tincy Varghese FNB-44	A.K. Pal	Responses of vitamin E (-tocopherol) on physio-biochemical changes of *Cirrhinus mrigala* (Ham. 1822) exposed to hypoxia
4	Mr. Mishal P. FNB-45	S. Dasgupta	Physio-biochemical changes during induced gonadal maturation and hydration in *Clarias batrachus* (Linn. 1758)
5	Ms. Ashalaxmi Narendra FNB-46	N.P.Sahu	Growth and immunomodulation of *Pangasianodon hypophthalmus* (Sauvage) in response to dietary propolis extract
6	Ms. Rakhi Kumari FNB-47	Subodh Gupta	Chitosan based nano-carriers for delivery of exogenous enzymes in aquafeed
7	Mr. Nitish Kumar C. FNB-48	Sanjay B. Jadhao	Impact of endosulfan and temperature on functional reproductive physiology of fish and its nutritional remediation
8	Mr. Linga Prabu D. FNB-49	N.P. Sahu	Effect of fucoidan rich seaweed extract on growth and immunomodulation of *Pangasianodon hypophthalmus* (sauvage, 1878)

Fish Business Management - FBM

1	Ms. Shivta Kureel FBM-35	Swadesh Prakash	Marketing of ornamental fishes in national capital region
2	Mr. Prathvi Rani FBM-36	Sheela Immanuel	Export performance and competitiveness of Indian ornamental fish trade
3	Mr. Dipanjan Kashyap FBM-37	Swadesh Prakash	Socio-economic appraisal of Jagiroad dry fish market of Morigaon district, Assam

4	Mr. Sonmoina Bhuyan FBM-38	Swadesh Prakash	Socio-economic evaluation of fish farming practices in the Central valley zone of Brahmaputra, Assam
5	Ms. N. Bijaya Lakshmi Devi FBM-39	Sheela Immanuel	Study of fishers livelihood and fisheries management in Loktak lake region of Manipur
Post Harvest Technology - PHT			
1	Mr. Sathish Kumar K. PHT-58	G. Venkateshwarlu	Antimicrobial and antioxidant activity of spice extracts and their application in fish preservation
2	Mr. Sreejith S. PHT-59	G. Venkateshwarlu	Preparation and characterization of fish-gelatin based nanomaterials
3	Ms. Renyram M. PHT-60	B.B. Nayak	Development of restructured fish products and their storage characteristics during refrigeration
4	Ms. H. Mandakini Devi PHT-61	B.B. Nayak	Development of active biodegradable edible film from fish gelatin
5	Ms. Layana P. PHT-62	B.B. Nayak	Relationship between polyamine formation and histamine formation by Decarboxylase bacteria
6	Ms. Muhasinath P.V. PHT-63	B.B. Nayak	Effect of preprocessing treatments on yellow discoloration of squid
7	Ms. Mini Mol V.A.	B.B. Nayak. PHT-64	Effect of pH and salinity on growth and virulence of *Yersinia enterocolitica*
8	Mr. Ponkumar P. PHT-65	B.B. Nayak	Migration of heavy metals among different organs of *Loligo duvaucelli* (d'orbigny) in chilled storage

List of Ph.D. students awarded Ph.D. degree during 2011-2012

Sr. No.	Name of the student	Batch	Guide	Topic of the thesis
1.	Mr. Khuntia Marmu (FPM-216)	2004-2007	Pani Prasad	Development and standardisation of immunodiagnostics for detection of Noda virus in prawns
2.	Mr. Shailesh Kumar (AQ-263)	2006-2009	G. Venugopal	Comparative study of immunostimulants on growth, survival and disease resistance of *Macrobrachium rosenbergii* (de Man, 1879)
3.	Mr. M. Sekar (FNB-279)	2006-2009	S. D. Singh	Cloning and heterologous expression of growth hormone gene from *Pangasianodon hypophthalmus*
4.	Mr. Bhawesh T. Sawant (FRM-284)	2007-2010	S. K. Chakraborty	Biology and stock assessment of selected catfishes of Mumbai, west coast of India
5.	Ms. Sajitha S. (MC-226)	2004-2007	Imelda Joseph	Efficacy of fermented vegetable discards as a dietary ingredient for shrimp feed
6.	Ms. Babita Rani (IAC-207)	2004-2007	Shrinivas Jahageerdar	Development and evaluation of growth models in *Cyprinus carpio*
7.	Mr. A. P. Muralidhar (AQ-264)	2006-2009	M. P. Singh Kohli	Dietary supplementation of seaweeds for growth, survival and immunological effects on *Labeo rohita* (Hamilton, 1822) fingerlings
8.	Mr. Pradyut Biswas (AQ-234)	2005-2008	M. P. Singh Kohli	Cage aquaculture for raising stocking material in beel of Assam for enhancement of culture-based fisheries
9.	Mr. Biswajit Debnath (FBM-254)	2005-2008	R. S. Biradar	An economic analysis of fish production and demand in Tripura state, India

10.	Mr. Jayappa M. Koli (PHT-325)	2008-2011	S. Basu	Optimization of gel properties of gelatin extracted from *Otolithes rubber* (Bloch and Schneider, 1801) and *Nemipterus japonicas* (Bloch, 1791)
11.	Mr. Umesha D. (FB-246)	2005-2008	K. Pani Prasad	Production of a toxin gene knockout mutant live vaccine of *Aeromonas hydrophila* by using mobile group II Introns
12.	Mr. Sarada Kanta Bhagabati (FRM-311)	2008-2011	S. K. Chakraborty	Productivity and ichthyofaunal diversity study on Dhasal reservoir in Thane district, Maharashtra
13.	Mr. Santosh Kumar (FG-300)	2007-2010	Gopal Krishna	Genetic studies on growth and texture of giant freshwater prawn *Macrobrachium rosenbergii* (de Man 1879)
14.	Ms. Sneha Suman Siman (PHT-223)	2004-2007	K. V. Lalitha	Ecology of psychrotrophic pathogens in refrigerated packed seafoods
15.	Mr. Brajendu Kumar (FPM-330)	2008-2011	K. V. Rajendran	Characterization of hemocytes of mud crab (*Scylla serrata*) based on microscopy and monoclonal antibodies
16.	Mr. Sujit Kumar Nayak (FPM-277)	2006-2009	K. Pani Prasad	Biopharmaceutical potential of the venom of selected coniids from Indian waters
17.	Mr. Ganikant Paswan (AQ-265)	2006-2009	Neelam Saharan	Effect of fipronil a Phenylpyrazole insecticide on *Labeo rohita* (Hamilton, 1822) fingerlings and its stress mitigation through dietary Riboflavin
18.	Ms. Ciji Alexander (FNB-332)	2008-2011	N. P. Sahu	Physio-metabolic responses of *Labeo rohita* (Ham) exposed to nitrite stress and its possible mitigation through dietary vitamin E and Tryptophan
19.	Mr. Ritesh Ranjan	2005-2008	K. Pani Prasad	Comparative study of

	(FPM-249)			different immunostimulants on the immune system of Asian seabass, *Lates calcarifer* (Bloch)
20.	Mr. Satendra Kumar (AQ-262)	2006-2009	Dilip Kumar	Eco-physiological understanding of reproduction in Asian catfish,*Clarias batrachus* (Linnaeus, 1758) under natural condition

Tenth Convocation

The Tenth Convocation of CIFE was held on 9th April, 2011. M. S. Swaminathan, Hon'ble Member of Parliament and Chairman, M. S. Swaminathan Research Foundation, Chennai was the Chief Guest, who also delivered the convocation address. Anil Kakodkar, Chairman, Rajiv Gandhi Science & Technology Commission and Former Chairman, Atomic Energy Commission was the Guest of Honour. W. S. Lakra, Director/Vice-Chancellor welcomed the distinguished guests. In his welcome address, he mentioned that CIFE is in the forefront of Human Resource Development (HRD) in fisheries, where more than 5100 students have completed their studies so far including 130 foreign nationals from Bangladesh, Egypt, Iran, Kenya, Laos, Malaysia, Myanmar, Nigeria, Phillippines, Sri Lanka, Sudan, Syria, Tanzania, Turkey, Vietnam, Yemen, etc. Two eminent scientists, Dr. K. V. Devaraj, Former Vice-Chancellor, University of Agricultural Sciences, Bangalore and Prof. T. J. Pandian, Former National Professor, ICAR, New Delhi were conferred with D.Sc. (Honoris causa) for their outstanding contributions to fisheries sector. A total of 86 masters and 29 doctoral degrees were awarded in different disciplines of Fisheries Sciences by W. S. Lakra, Director/Vice-Chancellor of the institute. Hiralal Chaudhuri Gold Medal was presented to students who topped in their respective disciplines of M.F.Sc.

The following students received the Dr. Hiralal Choudhuri Gold Medals during the convocation.

Dr. Hiralal Chaudhuri Gold Medal

M.F.Sc. (2007-2009)

Sl. No	Name of Student	Discipline
1	Mr. Ramkumar S.	Fisheries Resource Management
2	Mr. Arabinda Das	Aquaculture
3	Ms. Suma D.	Post Harvest Technology
4	Ms. K. Syamala	Fish Genetics and Biotechnology
5	Ms. Vidya R	Fish Pathology and Microbiology
6	Mr. Viswanatha B.S.	Fish Business Management
7	Ms. B Nightingale Devi	Fisheries Extension
8	Mr. Ranjith L.	Aquatic Environmental Management
9	Mr. J. Biju Sam K.	Fish Nutrition and Biochemistry (In absentia)

M.F.Sc. (2008-2010)

Sl. No	Name of Student	Discipline
1	Ms. Swati P. Sen	Fisheries Resource Management
2	Ms. Srijila C.K	Aquaculture
3	Mr. Biswajit Bal	Post Harvest Technology
4	Mr. T. S. Mayekar	Fish Genetics and Biotechnology
5	Mr. Antony J. P. P.	Fish Nutrition and Biochemistry
6	Mr. Anutosh Paria	
7	Mr. K. Ramkumar	Fish Pathology and Microbiology
8	Ms. Banti Debnath	Fisheries Extension
9	Ms. Deepti Ram M. Nair	Aquatic Environmental Management

Dr. C. V. Kulkarni Gold Medal was awarded to Ms. Banti Debnath - M.F.Sc. (2008-2010) (In person) and Mr. J. Biju Sam K. - M.F.SC (2007-2009) (In absentia)

Institutional awards

The following students were awarded the Institutional awards in the Best thesis category. For the year 2011 - 2012

Best M.F.Sc. Thesis

Aquaculture Division	Ms. Srijila C. K.
Fish Genetic and Biotechnology	Mr. Trivesh Suresh Mayekar
Fisheries Extension Division	Mr. Banti Debnath
Fish Pathology and Microbiology	Mr. Anutosh Paria
Aquatic Environment Management	Ms. Manimekalai D.
Post Harvest Technology	Ms. Jesmi Debbarma

Students' other achievements

Mr. I. Sivaraman, FEX (2010-2013 batch) bagged the **Best Research Paper Award** in National Conference on 'New Vistas in Indian Aquaculture' organized by CIBA, Chennai during 23-24 February, 2012 at Chennai.

Two of the students of FGB Division, **Mohd Ashraf Rather** and **Ms. V.L. Ramya** have been awarded the **Best Young Scientist Award** by Altech INC, USA, based on their thesis work carried out during the MFSc courses. They have secured first and second position, respectively in India and won 1000 USD and 500 USD, respectively. Mohd Ashraf Rather has secured first place in entire Asia-Pacific zone. Both the students worked on Nanotechnology (under Dr Rupam Sharma) in the FGB Division.

First prize was awarded for the **best poster presentation** on 'Ready to eat crab sandwich spread in retortable pouches', (authored by Sreelakshmi, K.R., Manjusha, L., Nagalakshmi, K. and Venkateshwarlu, G) presented in the First Indo-US International Conference on polymers for packaging applications (ICPPA-2012) held at Mahatma Gandhi University, Kottayam, Kerala during 31 March 2 April 2012.

First prize was awarded for the **best poster presentation** on 'Comparative evaluation of latency-associated genes of white spot syndrome virus (WSSV) for developing PCR test to detect latent infection' (PP-C17) authored by Reshma K. J, Reena Yadav, M. Makesh, C. S. Purushothaman and K. V. Rajendran. at the 8th Symposium on Diseases in Asian Aquaculture, 21-25 November. 2011, Mangalore.

Students' Participation in the 9th Indian Fisheries Forum and 8th Symposium on Diseases in Asian Aquaculture

A total of 108 students from CIFE, Mumbai participated in 9th Indian Fisheries Forum held in Chennai during 19-23 December, 2011 Several students also presented posters and papers. Several Students also participated in the 8th Symposium on Diseases in Asian Aquaculture held during 21-25 November, 2011.

Training abroad

Mr. I. Sivaraman, Ph.D (FEX) and **Mr. Pankaj Mudgaonkar**, Ph.D (FBM) attended the International Advanced Course on "Applied Economics in Fisheries and Aquaculture" University of Cantabria, Santander, Spain during 4-8 July, 2011

Research Achievements