



CHALLENGER

NEWSLETTER OF
Kerala University of Fisheries & Ocean Studies (KUFOs)

FEBRUARY 2017



FROM THE DESK OF THE VICE CHANCELLOR

Globally about 950 million people depend on fish as the principal source of animal protein. Fish is second only to rice in the diet of low income people in many developing nations. Fish is the most heavily traded food commodity from the primary sector in the international markets showing a higher growth rate than any other agricultural products. Fisheries in India has grown from subsistence fishing to the status of a multi billion industry during the last six and a half decades. The coastal people in our country, mainly depend on fish and fishery industry for their livelihood. It is our social responsibility to sustain the resources by judiciously utilizing it. Fisheries have made valuable contributions to economic development of coastal areas by generating employment opportunities, in remote and marginal areas. However, the marine fisheries sector is presently facing problems like excess fishing capacity, low catch per unit effort, wide income disparities among the sectors of the fishing community and resultant socio economic conflicts. Poor implementation of the various fishery management measures also add to the present crisis. Now the focus is given in the marine sector to improve the productivity by utilization of untapped resources in the Indian EEZ. The current total fish production in the country is 6.4 million metric tonnes (mmt) of which 3.4 mmt is inland and 3.0 mmt is marine production. The Fishery sector contributes about 1.21 per cent of the total GDP and 5.37 per cent of the GDP from agriculture sector and provides employment to 14 million persons. According to FAO estimates, the human consumption of fish is about 80% of the world's fish production at per capita of 17.1 kilogram which is expected to rise considerably by the year 2030. However, meeting the requirements of the growing population in the years to come is a big challenge. To meet this challenge, we have to look into the development of fisheries sector including aquaculture as it is the only available alternate food production system.

Qualified manpower is a constraint to look after the various stages of production and marketing. It is with this view that under graduate and Post graduate programmes in fisheries were promoted by Indian Council of Agricultural Research (ICAR) and various state governments. The field of fisheries is diversifying, thus in fisheries education the challenge would be to bring out a generation of skilled fisheries professionals to cater to the increasing needs of the sector. With this in view in 2010, the Kerala University of Fisheries and Ocean Studies (KUFOS), the first Fisheries and Ocean Studies University of the country was established by the Government of Kerala. The University not only offers diversified courses in Fisheries and allied subjects like Aquaculture, Fish Processing, Fishery Resource Management, but also provides new and emerging branches in fisheries like Biotechnology, Bioinformatics, Microbiology, Genetics, Molecular Biology, Biological Oceanography, Food Science and Technology, Environmental Sciences, Maritime Law, MBA in Fisheries and Rural Management, Port and Harbour Engineering. The University offers Ph.D programmes in all branches of fisheries and ocean studies. The University has established academic and research collaboration with all the important national fisheries institutes and universities. The extension and outreach programmes offered by the university are a boon for those who are in the fisheries field especially the coastal community. The University gives emphasis on imparting excellent education and skill development to our students. The campus gives them ample opportunity to develop their overall personality including their creative talents in arts and sports literary activities.



Prof. Dr. A. Ramachandran
Vice Chancellor

KUFOS gets new Vice Chancellor



Prof. Dr. A. Ramachandran joins KUFOS as 2nd Vice Chancellor. He started the career as Scientist at Central Institute of Fisheries Technology (CIFT) after successfully completing Agricultural Research Service (ARS, 1984 batch). He got immense experience in the field of administration as well as research such as Registrar of Cochin University of Science and Technology (CUSAT) (2004-2013), Dean, Faculty of Environmental Studies, Director, School of Industrial Fisheries (2011-2014), etc. He is currently the advisor and mentor for several research and Government agencies such as FSSAI, FIRMA, IRTCBSF, etc.

Prof. Dr. A. Ramachandran, Vice Chancellor, KUFOS has been nominated as an expert member in the Scientific Panel for Fish and Fisheries products of Food Safety and Standards Authority of India (FSSAI), Ministry of Health and Family Welfare, Govt. of India.

He is also nominated as:

- Member of Governing body of Kerala State Fisheries Resource Management (FIRMA)
- Chairman of Kendriya Vidyalaya Sangathan, Ernakulam Region
- Member, governing body, International Research & Training Centre for Below Sealevel Farming
- Member of the Scientific committee of the International Conference on "Climate change and Sustainability Development with a special reference to India"
- Member of Governing body of the State Fisheries Resource Management Society.
- Co-Chairperson of 41st Vice Chancellors convention jointly organised by Kamadhenu University, Gandhinagar, Gujarat.

Prof. Dr. K. Padmakumar, Pro Vice Chancellor, KUFOS attended UK BBSRC Newton Global Research Partnership Aquaculture Project Meeting and Workshop multi institutional research projects on 'Evaluating impacts of Prophylactic Health Products and novel alternatives on animal health and production efficiency in Intensive Asian and African Pond' and 'Development of alternative sustainability fish feeds to promote human health using novel non-conventional indigenous ingredients' with the financial assistance of Department of Biotechnology (DBT), Government of India during 19-28 June 2016 held at University of Sterling, Scotland, UK.

He was chair for the Technical Session on Fisheries and Veterinary Sciences during the 28th Kerala Science Congress held on 28th to 30th January 2016.

He was also invited to attend the Global Challenges Research fund workshop: Natural products to combat problems of the developing world' during 19th and 20th of December 2016 held at Manchester Institute of Biotechnology, University of Manchester, UK.

He was also nominated as 'member' of the Peer Review Team (PRT) to visit the Maharashtra Animal and Fisheries Sciences University, Nagpur and its constituent colleges to make on the spot assessment for accreditation.

CELEBRATIONS OF 'Jai Kisan Jai Vigyan' WEEK

Kerala University of Fisheries and Ocean Studies (KUFOS) celebrated 'Jai Kisan jai Vigyan' week from 23rd December to 29th of December 2016 in a befitting manner on the birth anniversary of Shri Atal Bihari Vajpayee and Late Shri Chaudhary Charan Singh, two former Prime Ministers of India, keeping in view of their immense contribution for promoting use of science for the welfare of farmers.

The week was celebrated by conducting open house in the Western campus of KUFOS which provided an opportunity for the public and students to visit and familiarize the activities and achievements of Kerala University of Fisheries and Ocean studies (KUFOS). Students from nearby schools, public and students of various schools in KUFOS visited the Public Aquarium, Museum, Fishing Craft and Gear Technology, Aquaculture and Fish Processing Technology. The University set up an exhibition stall at Mararikulam during the period from 27th to 29th December-2016. Models of fishing crafts, gears, visual aids showcasing various aquaculture practices were displayed in the stall. Besides these an essay writing competition was also conducted on the topic "Fishery Governance in India" 29th December 2016.



Fisheries Varsity celebrates 'Agricultural Education Day- 2016'

ICAR has directed to observe 3rd December of every year as Agricultural Education Day to commemorate the Birthday of the first Union Minister of Agriculture of India in 1946 and the first president of India, BharathaRatna, Dr. Rajendra Prasad. The University decided to conduct two week long celebrations as part of the Agricultural Education Day. Communications were sent to the nearby Schools and Colleges requesting them to visit KUFOS. The Public Aquarium and Museum were opened to the School children and public at free of cost on 03/12/2016 from 10am to 5pm. An interactive co learning workshop on "Philosophy Methods and Ethics in Science" was organized from 15th to 17th December 2016. Dr. K.Vijayakumaran, Principal Scientist and Programme Coordinator, Madras Research Centre of CMFRI engaged classes to the participants. The workshop covered theoretical exposure to the topics of philosophy of science, systems thinking, critical thinking and ethical practices in science. An Open House depicting the various activities and achievements of KUFOS, facilities available etc. was organized on 20th December 2016 from 10am to 5pm in the Western campus of KUFOS. Students from nearby schools, public and students of various schools in KUFOS visited the Public Aquarium, Museum, Fishing Craft and Gear Technology, Aquaculture and Fish Processing Technology. In addition to these the B.F.Sc. students undergoing Experiential Learning Programme (ELP) prepared value added fishery products viz. fish cutlets, burger, samosa, etc. and sold the same through the outlet provided to them.





Advanced training programme on Ornamental Fish Nutrition at KUFOS

KUFOS and Marine products Export Development Authority (MPEDA) jointly organized a two day advanced training programme on 'Ornamental Fish Nutrition and Feed Management' at its Headquarters, Panangad on 23rd and 24th November 2015. Forty ornamental fish farmers from various parts of Kerala attended the programme. Hon'ble Vice Chancellor, KUFOS Prof. Dr. A. Ramachandran in his inaugural address highlighted the scope of Ornamental fish culture and its export potential. He also emphasized the importance of quality livefeeds and formulated feeds in successful rearing at various stages of ornamental fishes. Shri. K.N. Vimal Kumar welcomed the gathering and described the role played by MPEDA in developing ornamental fish culture and export in India. Dr. Binu Varghese, Assistant Professor KUFOS in his introductory remarks described the changes happening in the ornamental fish trade scenario in the country. The importance of quality domestic production to counter the ever increasing import of ornamental fishes from other Asian countries was also highlighted.

The training sessions comprised of lectures in the fields of ornamental fish nutrition such as importance of formulated feed by Dr. P. Vijayagopal from the Central Marine Fisheries Research Institute (CMFRI), Kochi, Feed management by Prof. Dr. S. Shyama, Director of School of Aquaculture and Biotechnology, etc. Hands-on training on ornamental fish feed formulation and livefeed culture techniques was also part of the programme. After the successful completion of the training programme stock cultures of various live feeds were distributed to farmers.

KUFOS celebrated 16th National Fish Farmers Day



Government of India declared July 10th as National Fish Farmers' Day in 2001, to commemorate the successful induced breeding of the Indian Carps. This occasion was celebrated to honour two great scientists Dr. Hiralal Chaudhury and K. H. Alikunhi for achieving this landmark breakthrough in 1957. The day was celebrated in a befitting manner at KUFOS by organising a workshop for fish farmers on 12th July. The workshop was on 'Aquaculture in Kerala – trends and opportunities' and was attended by farmers from all over the state.



Prof. Dr. A Ramachandran, Vice Chancellor KUFOS inaugurated the event by releasing fish seeds into the ponds. In his inaugural address Hon'ble Vice Chancellor highlighted the importance of aquaculture in augmenting food security, generating employment opportunities and foreign exchange. Dr. Victor George, Registrar presided over the function. The major attraction of the program was the presence of K.H. Alikunhi's son Dr. Hameed Ali, who delivered keynote address. During the occasion a pamphlet of 'Karimeen Krishi' was released. Earlier Dr. S Shyama, Director, School of Aquaculture and Biotechnology welcomed the gathering. Dr. Daisy Kappen delivered vote of thanks.

Dr. Dinesh K and Dr. Daisy Kappen from KUFOS, Shri. M. Shaji from MPEDA, Shri. Aloysius from CMFRI and Shri. Lajjid K K from FFDA gave their expertise to the farmers. The workshop also witnessed sharing of experience by practising farmers like Shri. Sonnel Noronha, Shri. George Alexander. The programme was organised by School of Aquaculture and Biotechnology and Directorate of Extension and was coordinated by Dr. Binu Varghese, Assistant Professor.

On the Job Training programmes (OJT) at Fisheries Station, Puduveypu



On the job training programme has been designed and implemented by all Vocational Higher Secondary Schools to equip the students in practical learning of aquaculture techniques. The OJT has been allocated in such a way that 14 days each are given to first year and second year students. Fisheries Station has been serving as the authorized training centre for vocational higher secondary students since a decade. Students from Kaippamangalam(Thrissur),Njarakkal, Kadamakkudy, Thevara (Ernakulam) and Arthunkal (Alappuza) are brought to Fisheries Station on a regular basis for training. The students will be normally accompanied by three vocational teachers each from the respective schools.

During the technical Sessions, students are given hands on training on identification of brackish water fishes and shell fishes, Familiarization and live food organisms, Identification of mangrove, Culture of *Litopenaeus Vannamei*, Hatchery operation of *Vannamei*, Analysis of water quality parameters, Prawn filtration, Pre-stocking management of aquaculture ponds, Stocking, Health management and overall farm management in brackish water aquaculture, Harvesting, Natural seed collection and identification, Personality development and public speaking.

Fisheries Station initiated the trial culture of *L.vannamei* in Kerala with the support of the State Government and attained significant success. It has been acting as one of the leading advisory organizations for emerging entrepreneurs in shrimp farming. The OJT students are made a part of doubt clearing (by the farmers) whenever possible to boost up their confidence level. The students are given hands on training in the pre- stocking management starting with the eradication of weed fishes, liming, fertilization, water quality in aquaculture, which can significantly affect the health of the cultured organisms. Therefore, as part of the training, analysis of water quality parameters like salinity, ammonia, nitrate and nitrite, dissolved oxygen, turbidity and pH is practically taught to the students.

Most of the cultivable fish seeds are difficult to identify because of their small size and ambiguous morphological features. So, getting experience in the wild collection of fish seeds and identification from the experienced hands will be an added benefit to the students. Apart from the aquaculture sessions, students are also given classes in the ecological importance of mangroves and mangrove afforestation and also given training in the identification of various mangrove species. Students are given opportunity to involve in the afforestation programmes, conducted by the Station.

MANGROVE FESTIVAL @ KUFOS



Kerala University of Fisheries and Ocean Studies (KUFOS) had organized a One Day Mangrove Festival (KANDALMAHOTSAVAM in Malayalam) at its Fisheries Station Campus at Puduveyypu on 16th November 2016. The festival was inaugurated by Dr. A. Ramachandran, Hon'ble Vice Chancellor, KUFOS in presence of Sri. S. Sarma, Hon'ble MLA, Vypin Constituency; Dr. Bransdon S. Corrie, IFS., Director, Kerala Forest Research Institute; Prof. (Dr.) K. Padmakumar, Pro- Vice Chancellor, KUFOS; Dr. V.M. Victor George, Registrar, KUFOS; Dr. K.V Jayachandran, Director of Research, KUFOS; Dr. K.S. Purushan, Former Dean, College of Fisheries, Panangad and Dr. V.J. Dominic, Controller of Examinations, Sacred Heart College, Thevara. The event was planned on behalf of two mangrove projects operated at Fisheries Station funded by Government of India and Government of Kerala under the Principal Investigator-ship of Dr. K. Dinesh, Associate Professor and Head of the Station.

The major objective of the Mangrove Festival was to pass on the message of conserving the mangroves to the children. This group of plants provides immense ecological services to mankind as kidneys and lungs of the environment which has to be educated to the student community with due emphasis. The 'mangroups' formed for the mangrove protection comprising of selected students, parents and teachers from five Vocational Higher Secondary Schools of Kerala (Kaipamangalam, Narackal, Thevara, Kadamakkudi and Arthungal) and had participated in the event as responsible

volunteers. The event offered an opportunity to the students for understanding the brackish water aquaculture and the mangrove related ecosystem in a comprehensive manner. The festival witnessed lectures and orientation classes on Mangroves by renowned experts like Dr. V.J. Dominc, Sri. K.K. Reghuraj, Sri. V.K. Madhusoodanan, Dr. P. Sujanapal and Sri. Martin Lowel. An exhibition portraying the uses of mangroves, biodiversity associated with mangroves, artisanal fishing implements of Kerala, miniature of mangrove ecosystem etc. was organized as part of the programme. All the interested students were taken to the mangrove ecosystem of Fisheries Station for further understanding the importance and peculiarities of this system. The learning materials related to mangroves and brackish water aquaculture were distributed to the farmers and stakeholders on the occasion. The festival created a platform for the interaction between students, scholars, scientists and the public to spread the awareness on the significance of mangroves as a life supporting system in fisheries and environment. Quiz competition and drawing competition for all groups of students on “Mangroves and Ecosystem” were also conducted during the event and the winners were given prizes. An ‘Aqua-show’, aquarium fish sales, speed boating and variety of entertainment programmes including the magic show and solo performance of Sri. Chandra Bose etc. were the other highlights of the above mega event which attracted more than 1300 students and 300 public.





Aquatic Animal Health Management conducts awareness programmes

Fourteen Awareness programmes were carried out for farmers and Panchayat level co-ordinators on 'Health Management in Aquaculture', 'Importance of Disease Surveillance' and 'Emerging diseases'. Over 1100 stakeholders have attended the awareness programmes. Two Hands-on training programme of five days duration on 'Aquatic Animal Disease Surveillance and Diagnosis' for 20 fisheries department officials from 29 August to 2 September, 2016 and from 5-9 September, 2016 were also conducted. A training manual elaborating the protocols to be followed for disease diagnosis was also published for the benefit of practitioners of aquatic animal health. Two brochures about emerging diseases, EHP & EMS in Malayalam for farmers and a caricature poster were published for the promotion of disease surveillance programme.



Brochure on EHP & AHPND (EMS)



KUFOS Signs MoU with NIO

KUFOS signs MoU with National Institute of Oceanography to work together in the field of physical oceanography, marine geology, marine chemistry, marine biotechnology and microbiology. The official document was signed by Dr. S. Prasannakumar, Director, NIO and Dr. V.M. Victor George, Registrar KUFOS in the presence of Prof. Dr. A. Ramachandran, Vice Chancellor, KUFOS. Researchers from both institutions will be benefitted from the MoU which will currently last for next 10 years.



KUFOS decided to sign MoU with INCOIS

Kerala University of Fisheries and Ocean Studies (KUFOS) and Indian National Centre for Ocean Information Services (INCOIS) decided to sign Memorandum of Understanding for mutual collaboration in Academic, Research and Extension activities in the field of Remote Sensing & GIS, Physical Oceanography and Marine Geoscience.

In the joint workshop held at KUFOS, Panangad was attended by the higher officials including Dr. A. Ramachandran, Vice Chancellor, KUFOS and Dr. S. Satheesh Shenoi, Director, INCOIS, the draft MoU for mutual collaboration in Academic, Research and Extension activities between KUFOS and INCOIS was finalized.

Sri. Pattabhi Rama Rao and Sri. R.S. Mahendra, Scientist, INCOIS, Dr. V.M. Victor George, Registrar, KUFOS, Dr. K.V. Jayachandran, Director of Research, Dr. Daisy C. Kappen, Director of Extension i/c, Dr. S. Suresh Kumar, Director i/c, School of Ocean Studies and Technology, Dr. S. Rajendran, Academic Consultant, Dr. M.K. Sajeevan, Director i/c, School of Ocean Engineering and Underwater Technology participated in the workshop.

Tri party agreement between KUFOS, EIA & EIC

All the three parties has agreed to co-operate on the disciplines such as food processing, value added production, fish processing etc. and to provide practical exposure to students passing out from KUFOS for improved employment opportunity. The KUFOS students who have successfully completed UG, PG courses on above discipline based on selection by EIA Kochi and SEAI, Kerala Region will be provided training for a period of one year in both the organizations with fixed stipend by the respective agency where students are attached. The selected students will be given the opportunity to work in the seafood establishment and learn the processing and food safety requirements. Also, they will have opportunity to learn regulatory requirements for export of Fish & Fishery Products including Inspection and Quality Control at EIA Kochi. At the end of one year program, Export Inspection



Council of India, New Delhi will issue certificate as Technologists to the students who have successfully undergone training for one year and no certificate will be issued in case the student had left the program earlier.

KUFOS Signs MoU with CMFRI

Kerala University of Fisheries and Ocean Studies (KUFOS) signs MoU with CMFRI. Joint research programmes will be initiated in areas of marine fishery resources, mariculture, marine biotechnology, climate change, social sciences, extension and other allied areas of mutual interest. It will also facilitate the usage of library and laboratory facilities available in KUFOS and CMFRI on a mutual basis. CMFRI agrees to extend access to its library, laboratory, research vessel, digital resources to scientists and scholars sponsored by KUFOS during their visits to CMFRI.



KUFOS signs MoU with CIFT

Kerala University of Fisheries and Ocean Studies (KUFOS) signs MoU with CIFT to conduct basic and strategic research in fishing and processing, to design and develop energy efficient fishing systems for responsible fishing and sustainable management, for the development of implements and machinery for fishing and fish processing and for human resource development through training, education and extension.

Research Collaboration at Fisheries Station Puthuvypin



Dr. Joy Krushna Jena, DDG (Fisheries) and former Director of National Bureau of Fish Genetic Resources (NBFGFR) visited Fisheries Station on 22/6/2016. He was cordially welcomed by Dr. A. Ramachandran, Hon. Vice Chancellor, KUFOS and Dr. K. Dinesh, Associate Professor & Head, Fisheries Station. The DDG (Fisheries) passed on his hearty wishes to the University for taking effort to develop such a farm and suggested to expand the area of culture for augmenting the production. He recalled the two decades old memories of his research life at Fisheries Station, Puduveyppin while he came here as a research scholar. Later on the team visited the Vannamei hatchery of Fisheries Station which is the first in Kerala approved by Coastal Aquaculture Authority. Dr. V.S. Basheer, Principal Scientist and Head of Cochin Unit, NBFGFR accompanied Dr. Jena during the visit.



New Species Described from the Western Ghats

Three new species of freshwater fishes were described from the rivers of the Western Ghats by Dr. Rajeev Raghavan and Sri. Anvar Ali, Assistant Professors at the Department of Fisheries Resource Management, KUFOS. These include a species of stone loach, *Balitora chipkali*; a barb, *Pethia sanjaymoluri* and torrent catfish, *Amblyceps accari*. Papers describing *B. chipkali* and *A. accari* were described in *Zootaxa* while *P. sanjaymoluri* was described in the *Journal of Fish Biology*.

P Kumkar, U Katwate, R Raghavan & N Dahanukar (2016) *Balitora chipkali*, a new species of stone loach from the northern Western Ghats of India with a note on the distribution of *B. laticauda*. ***Zootaxa*** 4138(1): 155–170.

U Katwate, P Kumkar, S Jadhav, R Raghavan & N Dahanukar (2016) *Pethia sanjaymoluri*, a new species of barb (Teleostei: Cyprinidae) from northern Western Ghats, India. ***Journal of Fish Biology*** 88(5): 2027–2050.

N Dahanukar, R Raghavan, A Ali & R Britz (2016) *Amblyceps accari*, a new species of torrent catfish (Teleostei: Amblycipitidae) from the Western Ghats of India. ***Zootaxa*** 4109(2): 218–226.



Dr. Rajeev Raghavan attended the Annual Meeting of the IUCN Red List Committee held at Cambridge, United Kingdom from 22nd to 24th April 2016 in the capacity of 'Freshwater Fish Red List Authority Coordinator (Asia & Oceania)', a voluntary position he has been holding since 2012.

KUFOS LIBRARY & INFORMATION SYSTEM (KUFOS-LIS)



The KUFOS is entrusted with the triple functions of producing trained personal, carrying out research and extension activities in Fisheries sector. KUFOS Library and Information System (KUFOS-LIS) is envisaged for collection, organization and dissemination of Information especially on Fisheries and Allied Sciences. The library has acquired all basic Hardware & Software systems essential for modern Library and Information services, with financial assistance of ICAR and other agencies.

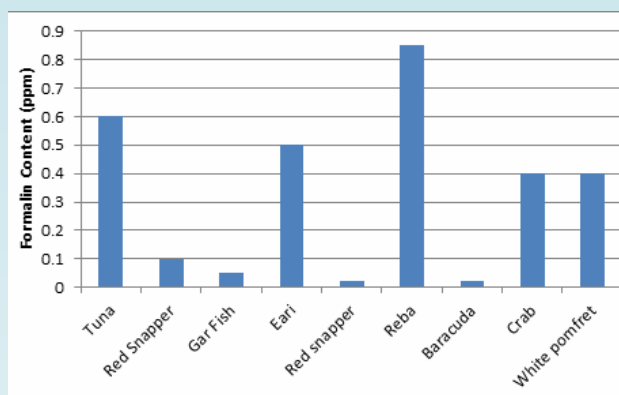
The Library collection was enriched by adding around 400 Books to the existing collection. Documentary resources include a collection of :- Books- 18500, Current Online Journals – 4896, Current Indian journals – 55, DDM collection –810, FAO Publication on Fisheries –1050, Bound Volumes – 1200, Reports - 600, Standards and Specifications- 150, Newspapers -10.

The prestigious Online Journal service of ICAR CeRA (Consortium for e-Resources in Agriculture) is available to KUFOS community through KUFOS LAN (IP address basis). Around 5000 Foreign and Indian Journals are available with full text, and document delivery service of member library collection, is also available through KUFOS Library.

KUFOS Institutional Repository named 'MEENAM' is enriched by adding 4000 pages to the present collection during the present year. KUFOS Library is a centre for Training new Library Professionals, approved by Apprenticeship Board of Govt. of India. The Library provides User Orientation Programmes to users in Literature Search, and training on IT based Library Services.

Unethical/Toxic preservatives in fish samples

Fish is an important food stuff and major source of protein all over the world. Many populations depend on fish as part of their daily diet, and this dependence is usually higher in developing countries than developed ones. In addition, fish is considered as the cheaper source of animal protein. India is a major producer of fish and ranks second in the world after China. As fish is highly perishable, fish sellers apply fish with preservatives like ammonia, formalin, sodium benzoate etc. to extend shelf life, make it stiff and keeps fresh look for longer period of time and these chemicals has been declared as a potential carcinogen and mutagen and thus harm the health of human beings. Based on the above mentioned situations, a study was conducted in Ernakulam district of Kerala to find out the presence of formalin in fish samples. Fish samples were collected from different markets in Ernakulam district. The presence and extent of formalin was tested spectrophotometrically at 420 nm by Nash's Test. It was concluded that the formalin content was high in fishes like Tuna, Reba, White Pomfret and Crab. This study was part of the State Plan Project conducted by Dr. Blossom KL, Assistant Professor, Leena Joseph and Seethal Xavier (Research Fellows).



KUFOS outreach programme



Directorate of Extension established under the KUFOS promotes development of fisheries by way of providing necessary information, imparting training and other extension support continuously to the fisherfolk and fish farmers. In addition to the dissemination of innovations in the field of aquaculture and fish processing technologies, it also helps to identify the problems of the farmers and offer solutions at the right time. The field level training, demonstrations and awareness camps organizing the various centers will help the farmers to increase their level of knowledge, improvement in their quality of life.

The first batch of M.Sc.(Statistics) students passed out from KUFOS in September 2016. One student of the batch got employment as Data Analyst in an MNC at INFOPARK, Cochin.

On The Job training (OJT) for Skill development

The Vocational Higher Secondary Education (VHSE) Students studying for Marine Fisheries and Sea Food production (MFSP) in the government Vocational Higher Secondary School, Vaikom West were given a 7 day On The Job training (OJT) for Skill development at the Department of Fishing Technology, School of Fisheries Resource Management and Harvest Technology. 29 students including 3 girls participated in this programme. The programme started on 23rd January 2017 and ended on 30th January 2017. The students were given training on various fishing gears, navigational equipments, Life saving and firefighting equipments.



Dr. K.B. Manojkumar was selected as a Member, Expert committee constituted by the Planning Board for formulating proposals for Fisheries sector as a part of the 13th Five year plan for the Kerala State. He is also selected as a Member, Expert Committee constituted for drafting the Fisheries Policy of the Kerala State Government.

Workshops/ Seminar/ Conferences

Library also conduct various training programmes and Workshops on and off for library professionals and users. KUFOS Library conducted two day workshops on JOOMLA-the Content Management Software, for Library Professionals with Financial Assistance of Kerala Library Association Ernakulam Region, on 5 & 6 August 2016. Total 45 professionals participated in the workshop. KUFOS Library conducted a Book Exhibition in March 2016.

The Library professional staff participated in workshop and seminars organized by various institutions and professional bodies. This helped a lot to improve the services of Library.

An international Conference Science & Technology for National Development was organised jointly by the Indian Science Congress Association and KUFOS on 25-26 October 2016. There was a session on “Applications of Statistics in Life Sciences”. The faculty members and students in the Department of Statistics actively participated in the conference by co-ordinating the session and presenting papers.

Seven students in the junior batch of M.Sc. (Statistics) have participated in the two -day Faculty Development Program on “Data Analysis to Data Science - Management Perspective” conducted at Bhavan’s Royal Institute of Management, Cochin on 5th and 6th of October 2016.

Conference on sale of stale fish in Kerala

Food safety commissioner of Kerala has conducted a conference at Kerala Medical Service Corporation Limited, Trivandrum on 19/12/2016. The meeting was to discuss on the current issues regarding the sale of stale fish in the markets of Kerala. Dr. Blossom K.L. and Dr. Abhilash Sasidharan, Assistant Professors of the Department of Preservation and Packing Technology, Kerala University of Fisheries and Ocean Studies (KUFOS) attended the meeting. The Scientists from Central Institute of Fisheries Technology (CIFT), Central Marine Fisheries Research Institute (CMFRI), Marine Products Exports Development Authority (MPEDA), Fisheries Department, Port and Harbour Department attended the programme. Among various decisions taken, the duties entrusted on KUFOS are:-

- Consumer awareness initiatives through different media in association with MPEDA and CIFT involving the students of the university.
- Awareness programs targeting resident associations, women and teachers in association with NSS, Kudumbasree, Board of nutrition etc.
- Design of dissemination materials for IEC campaign on seafood safety in association with MPEDA and CIFT.

7 (Kerala) Naval NCC Unit, KUFOS for 2016-17

1. **Description:** A naval NCC Unit is functioning at KUFOS from 2007 with cadet strength of 50. In India, only one Fisheries Institution, KUFOS has the NCC Unit. All NCC activities are conducted without affecting the studies and duty leave will be granted to students for participating in Camps. The NCC Uniforms and Refreshments are distributed at free of cost. Almost all theory aspect of Naval NCC subjects is covered in BFSc Syllabus. Swimming is compulsory for all cadets. Students receive NCC 'B' certificate after two years of training and 'C' after three years of training. S Lt. V. S.Kunjumammed is serving as Associate NCC officer.
2. **Activities:** All the training activities were conducted as per the schedule issued from NCC. The Unit conducted a special parade on Republic day. Dr. A. Ramachandran, Hon. Vice-Chancellor, KUFOS was the chief guest, PVC, Registrar and all other teaching and non teaching staff and students attended the programme. Attendance is compulsory to all cadets on Independence Day and Republic day celebrations. Cadets planted trees in the campus in connection with environment day celebration. All cadets with other interested students participated in Yoga Seminar and practical session in connection with International Yoga Day Celebration.
3. Our Cadets have participated in various camps conducted by NCC in different places of the state. 8 cadets (4 Boys and 4 Girls) participated in Special Camp at Lakshadweep, 19 cadets have attended Annual training Camp at Neeleswaram, 2 cadets participated in River Expedition from Ernakulam to Alappuzha.
4. Total sanctioned strength is 50. The enrollment was completed in full allotted strength in current year. SD- 20 (Boys) SW-30 (Girls).





INAUGURATION OF OFFICE AUTOMATION

Smt. J Mercykutty Amma, Hon'ble Pro Chancellor of KUFOS & Minister for Fisheries, Harbour Engineering & Cashew Industry launched the Office Automation Campus Suite developed by NIC at KUFOS on 16.11.2016. On the same day MoU on Academic and research collaboration was signed with CMFRI and CIFT. Hon'ble Vice Chancellor Prof. Dr. A Ramachandran presided over the function. Prof. Dr. K Padmakumar welcomed the gathering, Adv. M Swaraj MLA, Dr. A Gopalakrishnan, Director CMFRI, Dr. C N Ravishankar, Director CIFT, Smt. Sherly George, President, Kumbalam Panchayat, Shri. T Mohandas, State Informatics officer, NIC, spoke on the function. Dr. V M Victor George, Registrar KUFOS gave vote of thanks.



NSS KUFOS UNIT

National Road Safety week

The National Service Scheme of KUFOS in association with the Sub Regional Transport Office, Thripunithura organized an awareness programme for students on “Safe Driving” as part of the National Road Safety Week on 20th January 2016. Mr. Vinod Kumar N., Motor Vehicle Inspector, handled the class at KUFOS, Seminar Hall. The aim of this campaign was to emphasize and accentuate people about the need of safe roads travel by applying just simple rules. NSS Volunteers then carried out the awareness campaign to the public by distributing hand-made pamphlets to those violating traffic rules and encouraging those following it by distribution of pleasantries.



Women's Day

Rural Aquaculture Work Experience (RAWE) of B.F.Sc. students



The Women's Day was celebrated in KUFOS on March 8, 2016 by the NSS Unit. Various competitions to identify the women icon of the campus was also organized, which included elocution, creative thinking and debate competition. Mrs. Merin Joseph, IPS was the Guest of honour on the occasion.



The final year students of B.F.Sc. course are regularly trained in Fisheries Station in brackish water aquaculture during their RAWE programme. The students are given hands-on training in all aspects of aquaculture for a period of two weeks. The students are given practical lectures on the aqua culture and seed production of *Litopenaeus vannamei*, conservation of mangroves, extensive brackish water fin fish culture etc. They are given opportunity to participate in all the pre stocking management steps of aquaculture including bund strengthening, desilting of ponds, weed fish eradication, liming, fertilization, larval production, stocking, feeding, nursery management, grow out culture, health management, sampling, water quality maintenance, probiotic application and harvesting. A feed back from the students was also collected at the end of the programme.



World Environment Day



International Day of Yoga

KUFOS NSS unit celebrated the International day of Yoga on 21 June 2016. Dr. A Ramachandran, Hon'ble Vice Chancellor, KUFOS inaugurated the function. A delegate from Michigan State University, USA participated in the function. Shri. Krishnakumar Menon K, Yoga instructor, delivered a talk on "Pranayama for everyone's wellness" and demonstrated various yogasana to the participants.



Swachh Bharat Mission

As part of Swachh Bharat Mission, a campaign was carried out by the NSS KUFOS unit. NSS volunteers were split into two groups. One group of 20 students visited the nearby Raman Memorial LP School, Nettoor and gave talks for creating awareness of maintaining personal hygiene and the importance of keeping the surrounding clean for the lower primary students of the school. Harts and placards depicting the uptake of cleanliness were also displayed. The teachers of the school also participated in the programme and together they cleaned the nearby surroundings of the school.

Meanwhile the second group was involved in cleaning the university campus. All the solid waste (plastic, glass, paper, e-waste etc) were collected and segregated in the western campus of the university. The students took special care to convert a long standing dump yard of the campus into a garden.



Swachh Bharat Pakwada

NSS Unit at KUFOS organized a one-day program as part of Swachh Bharat Pakwada at KUFOS campus on August 5th, 2016. Hon'ble Vice Chancellor of KUFOS, inaugurated the one-day workshop on "Empowering youth towards waste management". Two experts in the field of solid waste management were called upon as resource persons viz., Dr P Ahamed Former Director Centre for E Learning KAU & Dr T N Jagadeesh Kumar Former Director of Students Welfare to empower the volunteers on different waste management. In the forenoon Dr. Ahamed engaged classes on "Group dynamics in Participatory Waste Management". Later the whole group including students and teachers were divided into small groups of 10-12 and each group was assigned an issue related to waste management for discussion for half an hour. Then one student from each group presented their findings followed by a talk by Dr. Jagadeesh on "Scientific solid waste management practices". In the afternoon groups split-up and carried out waste management practices in different parts of the campus that they learned from the resource persons.



Kalashikha-2016



Extracurricular activities are part of the campus. Students Union organised the arts festival, 'Kala-sikha 2016' between 30th Aug and 1st Sept 2016. Famous malayalam movie director, Mr. Vinayan inaugurated the festival. Students showed their talents in various competition items such as solo to group items which comprised of craft, various arts forms, etc. Ms. Amrita J Nair (BFSc 2013) was selected as Kalathilakam, Mr. Vishnu Rajendran (BFSc 2015) as Kalaprathibha and Ms. Anjana Sunil (BFSc 2013) as Sargaprathibha. Malayalam movie director, Mr. John Paul was the chief guest during the closing ceremony. Famous cine artist Mr. Saju Navodaya distributed the certificates to winners.

International Workshop

An International workshop on Multi Omic approach to identify genetic factors determining the heritability of twins in Indian Population- The Genetics of twinning In Kodinhi, India was held at KUFOS on 19- 28 October, 2016. The study was carried out by an International twin consortium (IT) formed jointly by University College, London, Institute of Tropical Medicine, Germany, Centre for Cellular and Molecular Biology, Hyderabad, and KUFOS, Cochin.

Kodinhi is a village in Malappuram district in Kerala, and has grabbed International attention due to its high rate of multiple births. This project has been designed to identify the scientific reasons behind the multiple births in Kodinhi. Further studies will be carried out in chick and zebra fish embryos to analyze the patterning and cell differentiation during development stages. The Workshop included short talks on development of twins and gave hands on training to research scholars and students for the collection of data. Analysis of genetic and familial data from the population of Kodinhi collected through a questionnaire, photography and collection of blood/ saliva.

Prof. Dr. Gopakumar, Director of the School inaugurated the workshop. The training was supervised by Dr. T.P. Velavan (University of Tuebingen), Dr. Kaustubh Adhikari and Mrs. Maracrena Fuentes Guajardo of University College of London, UK. Prof. Claudio Stern, UCL, UK and Dr. Thangaraj, Scientist, CCMB, India interacted with the students through online contact classes.



Independence Day Celebration

NSS KUFOS unit actively participated in the 70th Independence day celebrations at the Main campus. A patriotic song competition was held for students on the day. Hon'ble Vice Chancellor, Dr. A. Ramachandran and Volunteers took oath to safeguard national integration on the day.

NSS Day celebration and Orientation Programme for NSS Volunteers

The NSS day was celebrated on 24th September 2016 at the KUFOS main campus. This included a one-day orientation programme for the new batch of NSS volunteers. Mr. Satheesh S. Potti, Assistant Professor, DB College, Thalayolaparambu was the invited guest.

Visit of Dr. Eric Godwin Silas to Fisheries Station, Puduveyypu

Dr. E.G. Silas (former Vice-chancellor, Kerala Agricultural University and former Director of CMFRI) a well known Ichthyologist, Conservationist and Science communicator visited Fisheries Station on 31/08/2016. Dr. Silas gave an orientation class to the research staff of Fisheries Station on planning and execution of various projects of the Station. He whole heartedly appreciated the Vice-Chancellor, KUFOS and Head of Station for establishing the Vannamei farm and hatchery at the Station. Dr.Silas visited the mangrove areas and culture ponds of the Station and offered a few advices for further strengthening the activities. He urged the Head of the Station to set up a mangrove integrated crab unit as part of the Mangrove Research Centre for making it a model unit for the country.



Mr. Arsenio Santos III visited Fisheries Station

Mr. Arsenio Santos III, a milk fish hatchery owner and aquaculturist from the Philippines visited Fisheries Station on 10-01-2017. He was introduced to the University by Dr. Eduardo Leano, Coordinator, Aquatic Animal Health Programme, Network of Aquaculture Centers in Asia-Pacific (NACA), Bangkok. Mr. Arsenio explained various activities related to Milk fish culture and seed production to the research staff of KUFOS. The Philippines is a traditional milkfish country. The fish is locally called as “Bangus”. Commercial “Bangus” production has a history of more than 100 years in the country. Now, the Philippine is one of the top milk fish producers in the world along with Indonesia and Taiwan. Philippines have been exporting milk fish to various countries including USA, U.K, Canada and Japan. The major food item of milk fish in extensive ponds still remains as “Lab Lab”. Milk fish sexually matures in 5 years, but the brooders are selected for commercial production only when they attain 8 years old. The female brood fish is called “Sebalo” which can produce 5-6 million eggs per year. In the Philippines, the mud crab (*Scylla serrata*) or “Alimango” and the blue crab (*Portunus pelagicus*) or “Alimasag” are the most common species harvested for local consumption and export. In culture ponds, crabs are fed with trash fish and detritus also forms an important food item. Moulting is essential for the growth of the crabs. During moulting, the crab becomes vulnerable to its enemies because of the soft shell. So, it buries itself in the mud and waits for its shell to harden. Male animals can grow to about 1.5 kg with a carapace measuring over 20 cm in width. Sexual maturity is reached in 5 to 6 months after hatching. In general, male crabs are larger than the females.



INFOFISH, Malaysia

INFOFISH intergovernmental organization provides marketing information and technical advisory services to the fishing industry of the Asia-Pacific region with its head quarters in Kuala Lumpur, Malaysia. Its activities include bringing buyers and sellers together, publication of current and long term marketing information and operations of technical advisory and specialized services. In addition to organizing exhibition, conferences, workshops, seminars and training programmes, INFOFISH also undertakes consultancies on all aspects of fisheries, pre harvest, harvest and post harvest. Dr. Sreenath P.G., Senior Technical Advisory Officer has addressed the research staff of Fisheries Station, Puduveyppu during his visit on 29-12-2016 and shared his vast experiences in global fish production and trade. Further, an informative lecture was given to the B.F.Sc. students who were participating in the RAWE programme at Fisheries Station during the period.



Dr. Ira Levine, Professor, Natural & Applied Sciences, University of Southern Maine, USA delivered a talk on Microalgae cultivation and sustainability for biofuels, biofeeds, biofoods and biotechnology on 19th December 2016. His expertise includes algal genetic engineering, physiological ecology and new product development. He is awarded as the 2016-17 U.S. State Department, Distinguished Chair Fullbright and the 2009-2010 Fullbright New Century Scholar



Dr. Gustav Paulay, Curator at Florida Museum of natural history, University of Florida, USA delivered a talk on 'Coral biodiversity' on 1st December 2016.





BACHELOR'S PROGRAMME

B. F. Sc.(ICAR Stream)

Bachelor of Fishery Science (**B. F. Sc.**) - It is a four year (8 semesters) programme. It is a multi-disciplinary course and the student has to undergo rigorous training on various aspects of fishery science.

PG PROGRAMMES

Master of Fishery Science (M.F.Sc.)-ICAR Stream

M.F.Sc. Fish Biotechnology
M.F.Sc. Fish Genetics and Breeding
M.F.Sc. Aquaculture
M.F.Sc. Aquatic Animal Health Management
M.F.Sc. Aquatic Environment Management
M.F.Sc. Fish Nutrition and Feed Technology
M.F.Sc. Fish Processing Technology
M.F.Sc. Fisheries Economics
M.F.Sc. Fisheries Engineering and Technology
M.F.Sc. Fisheries Resource Management

Master of Science (M.Sc.)-UGC Stream

M.Sc. Applied Geo Sciences
M.Sc. Biological Oceanography and Biodiversity
M.Sc. Biotechnology and Bioinformatics
M.Sc. Climate Science
M.Sc. Disaster Management
M.Sc. Food Science & Technology
M.Sc. Marine Chemistry
M.Sc. Marine Microbiology and Marine Drugs
M.Sc. Physical Oceanography and Ocean Modelling
M.Sc. Remote Sensing, and GIS
M.Sc. Statistics

MBA

MBA with specializations in Finance, Marketing, Human Resource, Rural and Fisheries Business Management MBA Energy Management

LLM

LLM Maritime Law (Evening Course)

M Tech

M Tech in Integrated Coastal Zone Management
M Tech in Fisheries Engineering
M Tech in Ocean and Coastal Safety Engineering
M Tech in Coastal and Harbour Engineering

3. DOCTORAL PROGRAMMES

PhD program are being offered under all the faculties of the university.

4. DIPLOMA PROGRAMME

Diploma in Brackish Water & Marine Aquaculture

5. PG DIPLOMA PROGRAMMES

PG Diploma in Industrial Aquaculture
PG Diploma in Aquarium Science and Technology
PG Diploma in Maritime Law

