



# CHALLENGER

QUARTERLY NEWSLETTER OF  
KERALA UNIVERSITY OF FISHERIES & OCEAN STUDIES (KUFOS)

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## 04

KUFOS hosts India's first  
international conference  
on Blue Economy



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## NEW APPOINTMENT

### Dr.K.Manjusha

(Assistant Professor in Microbiology)  
School of Ocean Science and Technology



**D**r.K.Manjusha has Post-Graduate Degree in Microbiology from Bharathiar University, Coimbatore and PhD in Microbiology from Cochin University of Science and Technology, awarded in 2012. She has got over a decades' experience in teaching microbiology. She was working as Assistant Professor in Microbiology in St.Xavier's College for Women, Aluva for 8 years prior to joining with KUFOS. She had also worked as Lecturer in Microbiology on FIP deputation vacancy, Department of Microbiology, SreeSankara College, Kalady for a period 3 months and for 2.7 years as Guest lecturer in Union Christian College, Aluva. She is the

Principal Investigator of a major project (on-going) funded by Kerala State Council for Science Technology & Environment entitled 'Diversity & Biotic Potential of Yeasts from the Mangroves of Central Kerala'. She is a Member of the Board of Examiners for PhD Thesis Adjudication Yenepoya (Deemed to be University, Mangalore), Microbiology Board of Studies member of Mahatma Gandhi University, Kottayam, Expert Committee member of P.G Microbiology Syllabus revision M.G University. Her research interest is in the area of bioactive compounds from microbes.



Vice Chancellor Dr.A.Ramachandran inaugurates Kerala Piravi Celebration and Malayalam week observation in KUFOS. Registrar B.Manoj Kumar, Finance Officer Joby George P, Writer Priya K Nair, KUFOS Staff Club Secretary Dr.K.Rajesh and Convenor Dr.Daisy C Kappen are also seen

## Malayalam Day

The 63rd formation day of Kerala State was celebrated as 'Malayalam Day' in KUFOS on November 01, 2019 in a grand scale with cultural events and literature quiz competition participated by teaching and non teaching staff. Vice Chancellor Dr.A.Ramachandran inaugurated the celebrations in a

function presided over by Registrar Dr.B.Manojkumar. Noted writer and translator Dr.Priya K.Nair was the chief guest of the function. Inauguration of KUFOS Staff Club was also held on the occasion. In recognition of contributions made in the field of Malayalam literature, KUFOS staff members Dr.K.Dinesh and Mrs.Dhanyas T.M were honored with mementos as token of appreciation by the Vice

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Chancellor. Director of Research Dr.T.V.Sankar, Finance Officer Joby George P, Staff Club Secretary Dr.K.Rajesh, Convener of the programme Dr.Daisy C Kappen were spoke on the occasion.

The Computer Cell team represented by Mrs Beena Biju and Ms Manju Martin has won the first prize in the Malayalam literature quiz competition held as part of the celebration.

# FROM THE DESK OF THE VICE CHANCELLOR

**Prof (Dr) A.Ramachandran**

Vice Chancellor



**Y**ear 2019 was really fruitful for Kerala University of Fisheries and Ocean Studies (KUFOS) in all sense. KUFOS has joined hands with more than 10 national and international institutions during the year for cooperation in the areas of research and academic. Memorandums of Understanding (MoU) have been signed with different organisations including Cochin Port Trust, Central Coastal Agricultural Research Institute (CCARI), Gender in Fisheries and Aquaculture (GFA), Kerala State Remote Sensing and Environment Centre (KSREC) and Swiss based organic food giant COOP. I am sure that the tie-ups with institutions of repute will open more avenues to students and researchers of KUFOS and give them more exposure in their area of study.

I am happy to share that KUFOS study on the Vembanad Lake, which revealed the presence of alarming levels of plastic in Kerala backwaters, has made positive impact to the society. The study reported in the 76.5 sq/km area of Alappuzha-Thannermukkom sector of Vembanad, the presence of 4,276 tonnes of plastic garbage in the bottom sediments, which works out to 55.9 tones per sq/km area. The result shocked the planners, media and bureaucrats alike. This is one of the factors that triggered the Kerala Legislative Assembly's unanimous decision to enact a law, which came to force on 01, Jan 2020 to curb use of one time use plastic carry bags and similar plastic products.

Yet another major achievement of the KUFOS in 2019 was the successful

hosting of the India's first Blue Economy Conference. The International conference on Blue Economy and Aquatic Resources - Aquabe 2019, which discussed the potential of development and growth of the economy through sustainable exploitation of sea and inland water resources, was held under the leadership of KUFOS during 28-30 November in Kochi. Around 500 stake holders representing various countries including researchers and policy makers took part in the conference.

Considering the importance of the India's first blue economy conference, the Ministry of External Affairs, Govt. of India and the Indian Ocean Rim Association (IORA), under the direct leadership of its Secretary General DrNomvuyoNokwe has organized the 2<sup>nd</sup> Somalia and Yemen Development Programme as a special session during AQUABE 2019 for the benefit of fisheries sector of Somalia and Yemen. The two day session was dedicated to capacity building of fisheries professionals from these two countries.

Another notable activity of KUFOS with public benefit orientation is a radio broadcast series, jointly executed with AIR Kochi FM, which is highly result oriented in creating public awareness on importance of blue economy as well as on the activities of KUFOS in the academic and research field. Its obvious that for development of science, not only the sincere efforts that matters, but also the exposure to the public and stakeholders in the concerned areas.





State Fisheries and Harbour Minister J Mercykutty Amma inaugurates the three day blue economy conference hosted KUFOS at Kochi. KUFOS Registrar Dr.B.Manojkumar, FICCI representative Deepak L Aswani, Dr.C.S.Shenoi, Director, INCOIS, Dr Nomvuyo Nokwe, Secretary General of IORA, Vikram K. Doraiswami IFS, Joint Secretary of Ministry External Affairs, Dr.Bert Enserink, Director of Technical University Delt, The Netherlands, Dr.T.V.Sankar, Director of Research, KUFOS are also seen in the picture.

## KUFOS hosts India's first international conference on Blue Economy

India's very first international conference on Blue Economy and Aquatic Resources -Aquabe 2019 was held during 28-30 November, 2019 at Hotel Le Meridien, Kochi. The three day conference, hosted by the Kerala University of Fisheries and Ocean Studies (KUFOS) discussed potential of development and growth of economy through sustainable exploitation of sea and inland water resources. State Fisheries Minister and Pro Chancellor of KUFOS J.MercykuttyAmma inaugurated the conference and urged planning experts and scientists to consider small and marginal fishermen, fish farmers and women fish workers while planning and implementing blue economy projects in the country. This marginalised section of fisheries sector would be the centre of blue economy projects, she added.

Dr.Nomvuyo Nokwe, Secretary General of Indian Ocean Rim Association (IORA), an international organization of 22 countries sharing coastline of Indian Ocean delivered the key note address. Vikram K.Doraiswami IFS, Joint Secretary of Ministry External Affairs, Dr.S.C.Shenoi, Director of Indian National Centre for Ocean Information Services, Dr.Fisiha GetachewArga,

Vice President of Hawassa University, Ethiopia, Dr.Bert Enserink, Director of Technical University Delt, The Netherlands were other speakers in the inaugural function. Dr.Ramachandran, Vice Chancellor and Chairman of the organizing committee presided over the inaugural session.

The main themes of the Aquabe 2019 were selected on the IORA guidelines. They are -Aquatic Resources Management (living and non living), Aquatic production systems, Climate change impacts on blue economy, ocean health & global warming, Aquatic products and technologies and Education and capacity building. Around 500 stakeholders representing various countries including researchers and policy makers participated in the conference.

A National expo of fisheries and ocean science institutions and industries was also organised as part of blue economy conference. 35 national institutions representing fisheries and allied industries were participated in the expo. Dr Nomvuyo Nokwe, Secretary General of IORA has inaugurated the national expo.



## Somalia and Yemen development programme

Considering the importance of the conference, the Indian Ocean Rim Association (IORA) has organized Somalia and Yemen development programme as a special session during AQUABE 2019 for the benefit of fisheries sector of Somalia and Yemen. The two day session was dedicated to capacity building of fisheries professionals from these two countries. Scientists from India and other Indian Ocean coastal countries shared their expertise on the subject.

addressing the delegates of Somalia and Yemen development programme, KUFOS Vice Chancellor Dr.A. Ramachandran said that innovation and skill development are the two major spheres in which Somalia and Yemen were found lacking. "We are willing to share our skills and innovations with the fishermen of these two countries which, I am sure, would be a win-win situation for all stakeholders,"

He also told the delegates from the IORA member nations that KUFOS has set apart seats for students from foreign countries in all its academic programmes. "What we are bothered about is the employability of the students passing out from the 32 fisheries colleges in the country. The National Skill Mission has been launched to resolve this issue and we are sure that it would that it will pay rich dividends,"

R Sandhya, additional director, Department of Fisheries, Government of Kerala shared with the delegates about the innovative schemes implemented by the State Government to rejuvenate the fishing sector.

## Blue economy conference moots global coordinating body and guidelines

The three-day International Conference on Aquatic Resources and Blue Economy - Aquabe 2019 – held at Kochi during November 28-30 under the auspices of the Kerala University of fisheries and Ocean Studies (KUFOS) concluded with a call to the authorities to

establish a global coordinating body and international guidelines for sustainable and responsible blue economy.

The conference also called for ensuring national policies for blue economy and its various associated sectors and coordination between institutions to safeguard sustainability in blue economy in India. The recommendations also called for setting up of centre of excellence for Blue Economy in Indian Ocean Rim Association. An MBA course with special focus on Blue Economy was

the need of the hour, the conference attended by policy makers, bureaucrats, scientists, farmers, fishermen and exporters suggested. The recommendations formulated in the conference were vetted by a group of professionals that included Dr Bert Enserink (Technical University, Delt, Netherlands), Merrill J Williams (Asian Fisheries Society), Dr Paul Pandian, (joint secretary, Department of Fisheries, Govt of India), Prof A Ramachandran (Vice Chancellor, KUFOS), Prof Sanjay Chadurvedi (South Asian University), Dr T.V Sankar (Director of Research, KUFOS), and Dr Manoj Kumar (Registrar, KUFOS).



## The Colloquium

The Colloquium held as the end session of the Aquabe 2019 featured policy makers, fishermen, fish farmers, scientists and technologists turned out to be a landmark event with top bureaucrats and heads of research institutions offering solutions to problems faced by the stake holders. Paul Pandian, joint director, department of fisheries, Govt of India, inaugurated the Colloquium and KUFOS Vice Chancellor presided over it.

Mr. Paul Pandian and Dr K KVijayan, Director of Central Institute of Brackishwater Aquaculture (CIBA) offered solutions to the host of issues raised by fish farmers and exporters who had gathered from Kerala, Karnataka and Tamil Nadu. Dr. A. Ramachandran, said that the recommendations made by the experts who took part in the three-day conference would be forwarded to the Governments of India, Kerala, and to Indian Ocean Rim Association for further actions.

### *The main recommendations of the Colloquium are*

1. Aquaculture has to be treated on par with agriculture in all aspects to ensure the governmental support in terms of financial assistance, interest rate, land rules, electricity tariff etc.
2. Holistic approach is required to solve the issues pertaining to aquaculture and allied sectors linking with planners, policy makers, research organizations and industry representatives.
3. The registration formalities need to be simplified through a single-window system. The leasing policies have to be made farmer friendly and insurance coverage should be mandatory against crop loss due to various reasons including natural calamities.
4. There is a need to strengthen pathogen free brood and seed banks for all commercially important fin fishes preserving the genetic identity. Programmes on disease surveillance and health management of aquatic animals need to be strengthened and coordinated throughout the country.
5. Value addition may be promoted for better marketing by using cooperative approach.
6. Promoting start-ups and entrepreneurship in aquaculture and allied sectors including forward and backward linkages.
7. Ensure standards for seeds, feeds, other farm inputs and farm produces. Wherever seed/ feed, fish production units are lacking, special attention needs to be given for ensuring their timely availability. Under the light of the fish meal shortage in the market, more thrust needs to be given to find out alternative feed ingredients.
8. The concept of offshore mariculture needs to be promoted and wherever indigenous technology is lacking overseas collaborations need to be explored. When aquaculture is carried out in public water bodies preliminary studies have to be conducted especially in terms of carrying capacity to ensure the sustainability.
9. Since organic aquaculture is getting momentum globally, India needs to promote the organic aquaculture practices wherever possible.





Vice Chancellor Dr.A.Ramachandran inaugurates the KadalKadalolam radio broadcast series at AIR Kochi FM studio by participating in the first episode. Programme producer P.Balan is next to Vice Chancellor.

## KUFOS and AIR Kochi FM join hands for *Kadal Kadalolam* – radio series

Prior to the country's first international conference on blue economy held at Kochi during November 28-30, 2019 under the auspices of the KUFOS, the All India Radio Kochi FM Station has started a weekly half an hour broadcast series – *Kadal Kadalolam* – to disseminate the awareness on blue economy among general public. The radio series, which broadcast on every Friday 6.50 pm in *Kisanvani* is designed and executed jointly by KUFOS and AIR Kochi FM. It is an live interactive programme, in which listeners can participate over phone lively and clear their doubts with the KUFOS scientists participating in the programme,

Vice Chancellor Dr.A.Ramachandran inaugurated the radio series on November 01, 2019, the Kerala Piravi day by participating the programme as the first resource person on blue economy. He simply explained to the radio listeners the concept of blue economy and it's importance in the economic growth of a country like India.

On second episode onwards, a scientist from KUFOS is participating in the programme and explaining various facets and segments of blue economy and aqua resources. Week by week, the radio series is gaining popularity and by the broadcast of the 10th episode, the programme placed on the top of the rating chart of radio programmes being broadcast in the State of Kerala.

So far, apart from Vice Chancellor Dr.A.Ramachandran, Dr.V.N.Sanjeevan (Aqua resources and pollution), Dr.T.V.Sankar (Importance of research in blue economy), Dr.B.Manojkumar (need of scientific trawling), Dr.K.Dinesh (Importance of Aquaculture in Blue Economy) Dr.Anu Gopinath (Climate Change and Sea Weather), Dr.S.Sureshkumar (Impact of climate change on fish wealth), K.K.Raghuraj (Importance of Mangrove eco system) Dr.M.K.Sajeevan (Fishes of Kerala Coast and threats of existence) and Dr.K.Riji John (role of fishery awareness and education) have participated in the programme. Another 16 scientists and researchers of KUFOS have lined up to participate in the programme in the coming weeks. P.Balan, a well know Radio Programme Producer and winner of many national awards is the producer and presenter of the KadalKadalolam radio series and Raju E Raphael (Director of Public Relations and Publication, KUFOS) is the coordinator.

## KUFOS scientists discover new species of miniature well-dwelling subterranean fish

Scientists from the Kerala University of Fisheries and Ocean Studies (KUFOS) have discovered a unique new species of miniature well-dwelling subterranean fish from Kozhikode. The new species which has been named *Pangio bhujia* is the first species of eel-loach in the world that has been discovered to be living in subterranean environments. Eel-loaches are generally found in fast flowing streams in South and South East Asia.

A team comprising of scientists from KUFOS, IISER (Pune), Malabar Awareness and Rescue Centre for Wildlife, MARC (Kannur) and Natural History Museum, NHM (London) discovered the fish living in a six-meter-deep homestead well used for drinking and irrigations purpose, as well as from a



channel connecting a pond to an adjacent paddy field in the village of Cherinjal in Kozhikode. Subsequent studies on its anatomy and genetic structure revealed that this fish represents a never-before known species of eel-loach.

"This is an exceptional discovery" said Dr. Rajeev Raghavan, Assistant Professor at the Department of Fisheries Resource Management, KUFOS who led the study. "The new species has several unique characters including the absence of dorsal fin, which has never been encountered in the genus *Pangio* to which this new species belongs to, and is also unique among the order Cypriniformes and highly unusual even among teleost or bony fishes generally", he said.

Miniaturisation and reduction of characters in *Pangio bhujia* points towards a unique evolutionary story of the species, and of the genus *Pangio*, which will now be studied using advanced molecular and anatomical tools, said Dr. Neelesh Dahanukar, IISER, Pune, who collaborated on this work. The other members of the study team included V.K. Anoop from KUFOS, C.P. Arjun from MARC and Dr. Ralf Britz from NHM, London.

The extensive aquifers of the laterite areas in Kerala harbour one of the most unusual subterranean ichthyofaunas on our planet, most of them found in deep dugout wells. During the last one year, two other remarkable subterranean fish species were discovered by Rajeev Raghavan and his team at KUFOS. This included the bizarre snakehead, *Aenigmachanna gollum* and the blind shrimp, *Eurindicus bhugarbha*. All of these subterranean species were discovered by chance encounters because the habitat is difficult to sample with conventional methods, said Dr. Raghavan.



Vice Chancellor Dr. A. Ramachandran is submitting KUFOS study report on Vembanad lake to public at a meeting held at Marine Drive, Kochi



KUFOS Students collecting plastic waste from Marine Drive Kochi

## Alarming levels of plastic waste present in Kerala's backwaters, reveals KUFOS study

A research conducted by the scientists of Kerala University of Fisheries and Ocean Studies (KUFOS) in the Vembanad lake and coastal belts of Kochi, reveals the presence of heavy loads of macro-plastic litter in the bottom sediments.

In the 76.5 sq/km area of Alappuzha-Thannermukkom sector of Vembanad, the study reports the presence of 4,276 tonnes of plastic garbage in the bottom sediments, which works out to 55.9 tonnes per sq/km area, according to A. Ramachandran, Vice-Chancellor of KUFOS.

“Another alarming finding of the study is the sharp depth shrinkage of the lake, from 8 to 9 meters depth in 1930s to the present 1.6 to 4.5 meters depth,” he added. “The decreasing trend in the lakes depth profile is largely due to siltation and unless urgent interventions are made to reverse the trend the southern part of the lake is likely to disappear in one or two decades,” Dr. Ramachandran said.

The study was conducted by a team of

scientists under the leadership of Dr. V. N. Sanjeevan, Professor Chair of Centre of Excellence for Aquatic Resource Management and Conservation (CARMC) of KUFOS as part of the university's year-long campaign for a 'plastic-free' Kochi waters under the 'Swachhata Hi Seva' programme of the Central government. The silt and wastage that resulted from construction of 15 bridges in the past 20 years in the Kochi-Vypeen sector of Vembanad Lake have affected the smooth flow of Periyar into the sea, reveals the study.

KUFOS has already initiated detailed investigations through the CARMC on the long-term changes of Vembanad lake which is a Ramsar Site. (A Ramsar site is a wetland ecosystem designated to be of international importance under the Ramsar Convention. The convention on wetlands, known as the Ramsar Convention, is an inter-governmental environmental treaty established in 1971 by UNESCO, which came into force in 1975).

Dr. Ramachandran said that the University

has plans to undertake long-term clean-up campaigns of Kochi waters with the help of the public. Hoardings depicting the danger associated with casual disposal of plastic items will be kept at each 500 m distance of the Marine Drive walk-way, urging the public to dispose plastic items only in the bins kept at several points along the pathway. These bins have been placed by the University in collaboration with the corporate sector.

The study report was submitted to general public by the Vice Chancellor Dr. A. Ramachandran on October 16, 2019 in a public meeting held at Marine Drive, Kochi. Dr. V. N. Sanjeevan presented the details of the study to the public. Registrar Dr. B. Manojkumar presided over the meeting. CMLRE Managing Director Dr. M. Sudhakar, BPCL Manager Mr. Moosakutti, KUFOS Director of Research Dr. T. V. Sankar, Director of Extension Dr. Daisy C. Kappen, Senate Members T. Peter and V. Gabriel were spoke on the occasion.

Prior to the public meeting, around 150 students from the KUFOS under the auspices of the NSS have cleaned the Marine Drive premises by collection plastic waste. The students also sorted the collected plastic waste — cosmetic bottles, milk covers, hospital wastes — and exhibited them at the venue.

## Workshop on Skill Development

The Centre for Advanced Studies & Research in Entrepreneurship Development (CASRED) of KUFOS is regularly organizing Skill Development Workshops for the students of the University with an aim to inculcate the spirit of entrepreneurship and enhance their entrepreneurial skills. As part of the programme, a one day skill development

workshop was held on 9<sup>th</sup> October 2019 by Mr. Ganga Mohan, a freelance trainer who is versatile in training students and corporate managers for years. The workshop was targeted M.B.A. students of the School of Management and Entrepreneurship (SME) of KUFOS and 77 students from both MBA batches were participated. The trainer was

focusing on the element of “excellence” and not on “success”. According to him, success will follow excellence automatically. The trainer conducted a few management games on the skills essential for the management students and debriefed after the games. Overall, the workshop was interesting and an eye opener for the participants for their future corporate assignments.





*Vice Chancellor Dr A Ramachandran interacts with participants of Shrimp Class*

## Shrimp Class for overseas participants

A four day training programme named “Shrimp Class” was organized during December 03-06, 2019 for overseas participants at KUFOS by the Department of Aquaculture with the support of Indian arm of Aker Biomarine. Dr. A. Ramachandran, Vice Chancellor, KUFOS inaugurated the programme in the presence of Dr. B. Manojkumar, Registrar, Dr. Riji John, Dean Fisheries, Dr. T.V. Sankar, Director of Research, and Dr. K. Gopakumar, Professor of Eminence. Various aspects of shrimp farming including shrimp taxonomy, anatomy and physiology, shrimp breeding, culture, processing, marketing and global trade were explained to the

participants by subject experts. Dr. K. Dinesh, Associate Professor & Head, Department of Aquaculture led the training programme.

The main objective of the “Shrimp Class” was to introduce the farming methods and management of Indian shrimps to Chief Executive Officers, Technologists and Scientists who are closely linked to the food industry of the European Union. The participants of the training programme were mainly the associates of Aker Biomarine, a multinational food giant based in Norway and has operations in the entire European Union and in the U.S.

## KUFOS signs MoU with CCARI on research collaboration

The Kerala University of Fisheries and Ocean Studies (KUFOS) has signed a Memorandum of Understanding (MoU) with the Goa-based Central Coastal Agricultural Research Institute (CCARI) on collaborating in academic and research studies. The MoU was signed and exchanged between the KUFOS Registrar Dr. B. Manojkumar and the CCARI Director Dr. E. B. Chakurkar in the presence of Vice-Chancellor Dr. A. Ramachandran in a meeting held at the university head quarters at Panangad on November 08, 2019. The CCARI is a national research organisation under Indian Council of Agricultural Research (ICAR) and responsible for the promotion of sustainable and indigenous agricultural practices including fisheries in coastal areas across India.

According to the agreement signed, students of KUFOS can use the research facilities at CCARI in various fields of Ocean Studies, Fisheries, Environment studies and Climate Studies. Scientists of CCARI will also teach the KUFOS students as visiting faculties. In return, KUFOS will extend support to CCARI to organise aquaculture training programmes in various places across India.

KUFOS Vice-Chancellor Dr. A. Ramachandran said that through the MoU, KUFOS students will be able to extend their research activities to various agricultural practices including fisheries of other States since the CCARI is a multi-disciplinary research organisation with research



activities in various States and Union Territories. He said both institutions will jointly pursue research programmes on different topics related to ocean studies and climate changes which have impact on fisheries and fishermen community. For this, CCARI will be recognized soon as a research centre of KUFOS.

*The KUFOS Registrar Dr. B. Manojkumar and CCARI Director Dr. E. B. Chakurkar exchanging the MoU for research collaboration, in the presence of Vice-Chancellor Dr. A. Ramachandran. KUFOS Dean Dr. K. V. Thomas, CCARI Scientist Dr. G. V. Sreekant, University Engineer P. S. Jayakrishnan, School of Ocean Science and Technology Director Dr. S. Suresh Kumar were also seen in the picture.*

CCARI Scientist Dr. G. V. Sreekant, KUFOS Dean Dr. K. V. Thomas, Eminence Professor Dr. K. Gopakumar, School of Ocean Science and Technology Director Dr. S. Suresh Kumar were also present in the function, in which the MoU was signed and exchanged.





*Memorandum of Understanding signed between KUFOS and Cochin Port Trust for collaborating in ushering ocean research is exchanged between C Premaumari, Secretary of Cochin Port Trust and Dr B Manoj Kumar, Registrar of KUFOS on Saturday. Dr M Beena, chairperson of Cochin Port Trust and Dr. A Ramachandran, Vice Chancellor of KUFOS are also seen in picture.*

## Cochin Port Trust and KUFOS join hands

In a first of its kind tie-up between an academic institution and a major sea port to usher in the economic and social development of the country, the Kerala University of Fisheries and Ocean Studies (KUFOS) and the Cochin Port Trust joined hands to collaborate and

cooperate for the successful implementation ocean research projects including Blue Economy initiatives. A Memorandum of Understanding (MoU) was signed between KUFOS and Cochin Port Trust in this regard on 30<sup>th</sup> November 2019 at Kochi. Dr B Manoj Kumar, Registrar of KUFOS and C Premakumari,



*Dr Merrill J Williams, Chair of GFA and Dr.B. Manoj Kumar, Registrar of KUFOS exchange signed MoU in the presence of Vice Chancellor Dr.A.Ramachandran. Retired Supreme Court Justice K.Sukumaran and KUFOS Director of Research Dr.T.V.Sankar are also seen in the picture.*

## KUFOS and GFA sign MoU

The Kerala University of Fisheries and Ocean Studies (KUFOS) and Gender in Fisheries and Aquaculture (GFA) have signed a Memorandum of Understanding (MoU) on November 30, 2019 to work collaboratively in research areas related to women empowerment.

GFA is a wing Asian Fisheries Society

focusing on women empowerment in marginalized societies including fisher community. Dr Merrill J Williams, Chair of GFA and Dr.B. Manoj Kumar, Registrar of KUFOS inked the MoU in the presence of Vice Chancellor Dr.A.Ramachandran, which is expected to give a big fillip to research and development projects in this segment.

Secretary, Cochin Port Trust were the signatories of the MoU which opens up a vista of opportunities implementation of blue economy projects in the Kerala State.

Dr A Ramachandran, Vice chancellor, KUFOS who was present during the signing ceremony stated that ocean research projects could reach its full potential only with the cooperation and collaboration with major ports of the country. Dr M Beena IAS, Chairperson, Cochin Port Trust, who was also present on the occasion pointed out that it is imperative that all government departments and various institutions work together to make the new avenue a major success. She also said that the breaking barriers between institutions by joining hands is positive step.

## KUFOS hosts NCC Annual Training Camp



*Commodore R.R.Iyer presents ship replica to Vice Chancellor Dr.A.Ramachandran, made by NCC cadets in the validator function of annual NCC camp held at KUFOS*

KUFOS hosted a 10 days NCC Annual Training Camp (ATC) during the period 14th to 23rd November, 2019. Around 650 cadets (575 School student cadets and 75 college student cadets) participated in the NCC annual camp. 15 NCC cadets of KUFOS also took part in the camp. In this camp the cadets were given various training related to NCC activities such as early morning PT, drill, parade and Rifle training. Cadets also got opportunity to attend several lectures on different societal subjects. The valedictory function was chaired by Hon'ble vice chancellor, KUFOS, Prof (Dr.) A. Ramachandran.



*Vice Chancellor Dr.A.Ramachandran inaugurates Visual Problem Appraisal work at KUFOS Seminar hall. Director of Research Dr.T.V.Sankar, Dr.Bert Enserink, Director of Technical University Delt, Dr.Maya Raman KUFOS Faculty and Registrar Dr.Manojkumar are also on the dias.*

## KUFOS introduces visual media techniques in teaching and research

Aimed at exploring possibility of visual media techniques in teaching methodology for masters programmes and doctoral research, the Kerala University of Fisheries and Ocean Studies (KUFOS) has introduced a new and novel learning strategy to the academic community of the State. The new learning strategy - Visual Problem Appraisal (VPA), is a film based educational tool, where the researchers and students meet the problem and its stakeholders through filmed narratives. The new tool would help students and researchers for enhancing capability in problem analysis of complex issues and to facilitate the development of actions. The VPA is mainly used in workshop settings focusing on learning and change, or dealing with problem analysis and policy design. Tested and proved as a strong education tool in European universities, VPA was developed in the Netherlands by an inter-university research team.

The new learning strategy was introduced and familiarized to academic society of Kerala through a one-day Visual Problem Appraisal learning workshop at KUFOS held on November 26, 2019 in which PhD Scholars, post graduate students of various subjects including social sciences and faculty members of various education institutions of the State have participated. Dr.Bert Enserink, Director of Technical University Delt, The Netherlands, who is a core team member which developed VPA, was the resource person for the workshop. The theme selected for the workshop was flood management and water governance in Kerala.

While inaugurating the VPA workshop,

Dr.A.Ramachandran, Vice Chancellor of KUFOS, who did Visual Problem Appraisal (VPA) of Kerala's coast in 2004 in collaboration with scientists from the Netherlands, said "a VPA set consists of a series of filmed interviews complemented with documentaries. These films provide particular perspectives on the contextual reality of the stakeholders. The set gives prospect practitioners, civil society actors, decision- and policy makers an opportunity to watch and reflect on a series of stakeholder interviews. These filmed interviews and the accompanying documentaries offer the researchers and students a chance to explore the complex and conflictive arena of the issue at stake".

KUFOS will develop a curriculum and will depart training programmes for researchers and faculty members in VPA, said Dr.Ramachandran. For the purpose, a state of art audio-visual studio has already established in KUFOS, he added.

The workshop was a joint venture of KUFOS and four Netherland Universities who were the key partners of the research venture that developed the VPA. The four Netherlands universities are Van Hall Larenstein University of Applied Sciences; HAN University of Applied Sciences; the Delft University of Technology and Wageningen University & Research



*Dr.E.B.Chakurkar, Director of CCARI distributes accessories for fish farming to the participants of Capacity building cum distribution programme on aquaculture concluded at KUFOS. Aquaculture Dept Head Dr.K.Dinesh, CCARI Scientist Dr.G.V.Sreekanth, KUFOS Registrar Dr.B.Manojkumar, Vice Chancellor Dr.A.Ramachandran and Eminence Professor Dr.K.Gopakumar are also in the picture.*

## Capacity building cum distribution programme on aquaculture

A five day training programme on Capacity building cum Distribution on Aquaculture for Scheduled Caste farmers of Kerala State was held in KUFOS during 04-08 November, 2019. The training programme was funded and organised in association with Central Coastal Agricultural Research Institute (CCARI), Goa. The training programme, which was attended by over 50 farmers from across the State, was inaugurated by Dr. A. Ramachandran, Vice Chancellor, in the presence of Dr. B. Manojkumar, Registrar, Dr. Riji John, Dean Fisheries, Dr. T.V. Sankar, Director of Research, Joby George, Finance Officer, Dr. Daisy C Kappen, Director of Extension, Dr. G.B. Sreekanth, Scientist, CCARI, Goa and Dr. K. Dinesh, Assoc. Prof. and Head, Dept. of Aquaculture. Sessions on various aspects of aquaculture were delivered in the training programme by nine subject experts from fisheries and aquaculture industry. A field visit was also arranged on the third day of the training programme.

Dr.E.B.Chakurkar, Director of CCARI has distributed to all the participants accessories for fish farming including Fish seeds, feed, silpaulin sheets for making culture ponds, aeration devices, air tubes, air stones, water filtration devices and water quality kits at the end of the training programme to encourage them to enter into industry.



## Hands-on Training on Next Generation Sequencing and Analysis



Vice Chancellor Dr. A. Ramachandran addresses participants of Hands-on Training on Next Generation Sequencing and Analysis. Dr. Malali Gowda (M.S. Ramaiah University of Applied Sciences), Registrar Dr. B. Manojkumar, Eminent Professor Dr. K. Gopakumar, SOST Director Dr. S. Sureshkumar and Professor Dr. M. V. Joseph are on dais.

Next Generation Sequencing Analysis Technology training jointly organized by Adelbert Innovation Research, Cochin and Bengaluru Genomics Centre was held in KUFOS during November 4 to 7, 2019. While inaugurating the four days long training programme, KUFOS Vice Chancellor Dr. A. Ramachandran emphasized on the need to equip our scientific researchers with genomic analysis

technologies as it has revolutionized biological sciences. Genomic approaches in marine biodiversity will help further development of aquaculture, he pointed out.

Dr. Malali Gowda, internationally reputed genome scientist from M.S. Ramaiah University of Applied Sciences who led the training programme delivered the Keynote address in the inaugural function. Dr. Malali said NGS genomic research has applications that can help meet marine conservation challenges of food

security, biodiversity loss, and climate change.

Ms. Raji Pillai, Research Director and CEO of Adelbert Innovation Research said that the genomic information obtained by Next Generation Sequencing will augment the era of personalized medicine. Around 30 Scientists, doctors and researchers from across India were participated in the hands on training programme.

## KUFOS celebrates World Food Day

Dept. of Food Science and Technology, KUFOS in association with Association of Food Scientists and Technologists India –AFSTI (Cochin Chapter) and All Kerala Caterers Association celebrated World Food Day by organizing a workshop on “Prospects & challenges of Catering Industry in Kerala” on 15th October 2019 at KUFOS Seminar Hall. The function was inaugurated by Dr. A. Ramachandran, Vice Chancellor of KUFOS. Eminent personalities from food industry including Dr. B. Jacob, Dr. D. D. Nambudiri, Dr. K. Gopakumar, Mr. V. K. Varghese and Dr. P. T. Mathew all having commendable experience in food industry shared the dais. They highlighted the importance of eradicating hunger from the world and also brought home to the participants the great responsibility of each and every one of us to follow healthy diets for a Zero Hunger World since our actions would safeguard our future.

The World Food Day workshop was being highly beneficial and participatory with interactive sessions, demonstrations and lectures by Mr. Jacob Thomas (Asst Commissioner –Food Safety, Ernakulam), Mr. Biju P Abraham MIE, (General Manager, District Industries Centre), Dr. Bhadrar A (Former Government Analyst-Regional Laboratory, Kakkanad) and Dr. P. E. Doles (FSSAI, Kochi).

A Quiz program on Food safety was also conducted. Food Science students from 6 colleges attended the Quiz



Vice Chancellor Dr. A. Ramachandran inaugurates World Food Day celebration at university seminar hall. Dr. P. T. Mathew, Dr. K. Gopakumar, Dr. D. D. Nambuthiri, Dr. B. Jacob and M. K. Varghese are also seen in the picture.

competition. Mr. Raghunath, F Q Lab and Research Centre (P), Kochi and Dr. Rekha Menon, F Q Lab and Research Centre (P), Kochi were the Quiz masters. First prize was secured by students from KUFOS -Daliya and Nijila, both M Sc Food Science and Technology students. Second prize was secured by the team -Amrutha and Amala, both B Tech Food Technology students, KUFOS. Third prize was shared by two teams -Lakshmy Pillai and Ameena Salim, from College of Indigenous Food Tech, Konni and Megha G. Pai and Fathima K. Muhammed, both from St. Theresa's College Cochin. Prizes and certificates were awarded to the winning student by Dr. K. Gopakumar, Former Deputy Director General, Indian Council of Agricultural Research, New Delhi. In the plenary section,



## Digital Library Management Workshop

A three day digital library management workshop for librarians working in academic institutions was held in KUFOS Library during 21-23 November, 2019. The main focus area of the workshop, which was organized jointly

with Kerala Library Association (KLA), was to impart hands on training on the modern library automation softwares like 'Koha' and Greenstone. 20 librarians working in academic sector from across the State have participated in the workshop.

*Vice Chancellor Dr.A.Ramachandran inaugurates Digital Library Management Workshop at KUFOS Library. Finance Officer Joby George, Fisheries Dean Dr.K.Riji John, Registrar Dr.B.Manojkumar and Librarian Kunjumohammed V.Sare also seen in the photo.*

## Faculty Development Programme

School of Ocean Engineering and Underwater Technology of KUFOS has organized a three day workshop on Recent Research and Application Trends in Underwater Sensor Technologies during 11 -13, December 2019 . The objective of the course was to impart necessary and practical knowledge of components of latest research and applications of Underwater Sensor Technologies and areas not limited to Acoustics Arrays, MEMS Technology, Ocean Measurements, Underwater Sensor for Fishing Technology Investigations , Underwater sensor for Hydrodynamic model Investigations, Indigenous Sensor Development & Deployment, Hands on sensor integration and IoT using Raspberry Pi ,Sensor Data Monitoring & Analytics .



The resource persons for the workshop were Dr. G Suresh, Scientist E, NPOL, Kochi, Dr T K Sivadas, Retd.Principal Scientist, CIFT, Dr.Vijayakumar, Former Scientist, NPOL, Kochi, Prof. A K Prakash, Senior Defence Scientist, Dr Rajesh Maliyekkal, Associate Professor, Model Engineering College, Thrikkakara. All the Faculty Members of the School of Ocean Engineering and Underwater Technology were attended the training programme.

## Industrial visit



*M.Sc. Marine biology (2018-20 batch) with Dr. Swati Nagar at NCPOR, Goa*

The third semester M.Sc Marine Biology students undertook a field trip to Goa and Sindhudurg, Maharashtra from the 16<sup>th</sup> to 22<sup>nd</sup> of September 2019. The visit was intended to collect the flora and fauna of rocky and sandy shores of Goa and Sindhudurg and to understand various culture techniques being practiced in Malvan and Devgad Taluk of Sindhudurg district of Maharashtra under the aegis of the Mangrove Foundation. In line with the tour objectives, the students had an opportunity to observe the sandy and rocky beaches of the two states and they also collected representative samples from the various habitats, especially the intertidal biota. The team also visited two prestigious

research and development institutes in Goa, the National Institute of Oceanography (NIO) and the National Centre for Polar and Ocean Research (NCPOR), wherein they were exposed to the basic nuances of classical oceanography and advancements made by the country in polar research, respectively. The public outreach team of NCPOR also briefed the students on the multitude of opportunities available for Marine biology graduates in polar research and motivated them to consider the polar extremes as a viable option for doctoral research. The trip had an exciting and adventurous windup with the last day of the trip scheduled at the scenic spot of Dandeli in Karnataka.





*Dr.T.V.Sankar, Director of Research, KUFOS and INCOIS Principal Scientist Dr.Balakrishnan Nair introduce Machili app to fishermen in the awareness programme. KUFOS Faculty Member Dr.S.M.Raffi and Registrar Dr.ManojKumar are also in the picture.*

## Awareness programme on GEMINI and Machili app for fishers held in KUFOS

A one day awareness programme for fishermen of the four southern states, namely, Kerala, Tamilnadu, Andhra and Karnataka, jointly organised by the Kerala University of Fisheries and Ocean Studies (KUFOS) and Reliance Foundation was held in KUFOS on November 21, 2019 under the funding support of Indian National Centre for Ocean Information Services (INCOIS), Hyderabad. In the programme, scientists and fisheries experts enriched the fishers about the modern avenues of satellite and remote sensing applications on fishing and life saving applications at sea.

The Potential Fishing Zone (PFZ) mapping technique developed by INCOIS incorporating the satellite data and images pertain to sea surface temperature (SST), Ocean Colour Monitoring (OCM) and other ocean parameters explained in the awareness programme was a milestone achievement and boon for fishers, said Dr.Raffi S.M, Principal Investigator of KUFOS- INCOIS research project. The real time information dissemination through internet based mobile applications about PFZ and Ocean State Forecast (OSF) such as tsunami/ cyclone prediction, forecast and warning, wind, wave and current direction and speed etc. will be of immense use for saving the valuable life and property of fishers, seafarers and coastal populace, emphasized Dr.Raffi.

The state wise launching of a mobile application named "Machili app."

developed by Reliance Foundation was held in the awareness programme. This android application will give Ocean State Forecast (OSF) information from INCOIS to the android mobile phones of fishers in regional languages both as text and voice calls. Mr. Nafaaz, of Reliance Foundation explained that the app will ultimately reduce the time and fuel cost to a greater extent; as the fishers can avoid the unwanted wandering in sea in search of fish schools and fishing grounds; thus ease the fishing activities which will be a benefit for fishers who are presently facing severe economic doldrums due to minimal catch and soaring fuel price.

Dr. Balakrishnan Nair, Principal Scientist and Head, ISG Division, INCOIS narrated about GEMINI (Gagan Enabled Mariners Instrument for Navigation and Information), a recent initiative which is launched recently; a joint initiative of Airport Authority of India (AAI) and INCOIS under the GAGAN programme (GPS Aided Geo Augmented Navigation). The advancement of this technology is that fishers can avail information pertain to Cyclone/tsunami, wind and wave alert etc. from the satellite (GSAT-8) directly; anywhere in the sea where internet is not available. Fishers urged that an awareness programme of this kind has to be implemented in major fishing hamlets of Kerala which has immense relevance about saving their lives at sea and to augment the fish catch.

## Bakery products making training programme

The four day Training Programme on making of bakery products jointly organised by Centre for Advanced Studies and Research in Entrepreneurship Development (CASRED) and Centre for Excellence in Food Processing Technology (CEFPT) of was held during 10- 13 December, 2019 in the Bakery Production Line of KUFOS. There were 10 participants including six ladies. Basically, the workshop was meant for imparting hands-on experience on making bakery products.

Dr. T.V. Sankar, Director of Research, inaugurated the training programme and highlighted the role played by KUFOS for the community development and the scope of entrepreneurship development through CASRED. Dr.



SrinivasaGopal, Professor Chair, CEFPT, while felicitating the occasion, highlighted the potential of bakery industry in India and the opportunity available to the participants if they are developing into entrepreneurs. Dr. L. Suresh Mallya, Professor Chair, CASRED explained the training curriculum to the participants of the workshop.

Mr. Krishna Das and Mr. Anantha Narayanan, Foodastha, Nettoor, were the trainers for the workshop. They are well experienced in the bakery industry and themselves managing their business as well as their training programmes and consultancy services. Over the four days, they imparted technical knowledge and skill to the participants for making bakery products such as biscuit, cookie, bread, bun, rusk, and different type of cakes. The trainees were given hands-on experience who could pick up the intricacies and the methods, recipe etc., while putting their hands and mind for the production of the bakery items. Ms. Rachael Jacob, retired GM, Modern Industries Ltd., in her session, discussed the quality issues involved in the bakery products during the raw material, in-process and finished stages.

In the concluding session, the participants gave their valuable feedback and appreciated and thanked the organisers for having conducted this four day training programme. Some of them are planning of putting up their own units and start business in the bakery industry.. Dr. Suresh Mallya, Prof Chair of CASRED assured the participants continued support from KUFOS for their ventures. Ms. Rachael Jacob gave away the certificates of participation and the training programme was concluded on a high note of optimism and expectations.

## List of Publications

1. Sameera Shamsudheen, **Ramachandran A**, Deepak J and Harikrishnan M, 2019. DNA barcoding confirms species substitution of *Parastromateus niger* (black pomfret) using exotic species *Piaractus brachipomus* (Red Bellied Pacu), *International Journal of Fisheries and Aquatic Studies*, 7, 4, 314-320
2. **A. Ramachandran** and Asha Raymond, (2019). Review Article Bacterial Pathogens in Seafood – Indian Scenario, *Fishery Technology* 56, 1 – 22
3. **Jayashree RC, Subashchandran, K.P. and T.V. Sankar** (2019). Biodegradability of synthetic plastic – A review, *International Journal of Chem Tech Research*, 12, 6, 125-133.
4. S. J. Laly, **T. V. Sankar** and Satyen Kumar Panda (2019). Effect of extended period of boiling on allergic protein of flower tail shrimp *Metapenaeus dobsoni*, *Indian J. Fish.*, 66(3): 110-115. 110 DOI: 10.21077/ijf.2019.66.3.88139-14
5. **Raman, M., Dinakaran, A., Ravindran, A., Sankar, T. V., & Gopal, T. K. S.** (2019). Dietary Supplementation of ?-Carrageenan to Improve the Physio-Chemical and Functional Properties of White Bread. *Food and Nutrition Sciences*, 10(08), 997.
6. S Visal Kumar1, **KP Subhashchandran**, Thomas George, Ambily Paul, George Xavier, V Vijayasree and S Suryamol, (2019). Dinotefuran Residues and their Dissipation in Chilli Pepper (*Capsicum annuum* L.) and Soil and their Risk Assessment, *Pesticide Research Journal*, 31, 2, 211-219, doi: 10.5958/2249-524X.2019.00032.3
7. R.R, Remya, **S.R, Radhika Rajasree**, R. Vasantharaja, T.Y.Suman, K.Govindaraju (2019). *In Vivo* Toxicity Assessment of Laminarin Based Silver Nanoparticles from *Turbinaria ornata* in Adult Zebrafish (*Danio rerio*), *Journal of Cluster Science*, DOI 10.1007/s10876-019-01632-6. **IF:2.12**
8. Krishnakumar, K. N., Sayyida Rasala Hashmi, T. A., Jesiya, N. P and **Girish Gopinath** (2019). A Geospatial approach for Landslide Susceptibility assessment in Malappuram District, Kerala, India, *Eco chronicle*, 14 (2), ISSN: 0973-4155.
9. Varsha Prem, B.Gurugnanam, **Girish Gopinath** and Sorna Chandra Devadass C (2019). Creation of Laboratory Spectral Library of Beryl in Sevapure Area, Kadavur Basin, Karur District, Tamil Nadu, *International Journal of Engineering and Advanced Technology* (IJEAT) 9 (1), 5325-5327, DOI: 10.35940/ijeat.A2967.109119.
10. **Girish Gopinath**, Nimmi S and Surendran U (2019). Landuse Classification of Hyperspectral Data by Spectral Angle Mapper and Support Vector Machine in humid tropical region of India, *Earth Science Informatics*, DOI: 10.1007/s12145-019-00438-4
11. **Amitha Kurian**, Hien Van Doan, Wanaporn Tapingkae, **Preetham Elumalai** (2019). Modulation of mucosal parameters, innate immunity, growth and resistance against *Streptococcus agalactiae* by enrichment of Nile tilapia (*Oreochromis niloticus*) diet with *Leucas aspera*. *Fish Shellfish Immunol.* 14, 97, 165-172. (Impact factor: 3.185)
12. Jophy Jose and **Susamma A.P** (2019). Mechanical and Dielectric Studies on Natural Rubber Graphene Oxide Nanocomposites, *International Journal of Research and Analytical Reviews*, 6, 2, 8 – 26.
13. Jophy Jose and **Susamma A.P** (2019). Studies on Mechanical And Dielectric Properties Of Natural Rubber–Reduced Graphene Oxide Nanocomposites, *Journal of Emerging Technologies and Innovative Research*, 6, 6.
14. **C. S. Ratheesh Kumar**, K. R. Renjith, Manju Mary Joseph, P. M. Salas, P. Resmi and N. Chandramohanakumar (2019). Inventory of aliphatic hydrocarbons in a tropical mangrove estuary: a biomarker approach, *Environmental Forensics*. DOI:10.1080/15275922.2019. 1657983
15. Nanthini R., Majeed, S.A., Vimal, S., Taju, G., Sivakumar, S., Santhosh kumar S., **Devika Pillai, Sneha K.G., Rakesh, C.G.** and Sahul Hameed A.S. (2019). *In vitro* propagation of tilapia lake virus in cell lines developed from *Oreochromis mossambicus*. *J. Fish Dis.* 42 (11):1543-1552

## Conference publications

1. Little Flower T.J and **Beena Mary John**. Wave Attenuation by Mangroves – Numerical Analysis using SWAN Open Software, In Raghavan R., LimnaMol VP, John EM, Raj S, Balachandran S, George GJ, Sudarsan KS, Ranjeet K and Sankar TV (Eds) 2019 Book of Abstracts AQUABE 2019: International Conference on Aquatic resources and Blue Economy, 206p.
2. AryaRavindran and **Beena Mary John**, “Sustainable Shore Protection Measures – A Review”, Proceedings of International Conference on Frontiers in Marine Science Challenges and Prospects - MARICON 2019, CUSAT, pp. 54.
3. **PoojaPrasen, Suriyakala C D** “An exploration of noise mitigation techniques for superior pre processing of image ” In Raghavan R., LimnaMol VP, John EM, Raj S, Balachandran S, George GJ, Sudarsan KS, Ranjeet K and Sankar TV (Eds) 2019 Book of Abstracts AQUABE 2019: International Conference on Aquatic resources and Blue Economy, 206p.
4. **NebuPulickal, Suriyakala C D**, “Ergonomics on intelligent underwater communication” In Raghavan R., LimnaMol VP, John EM, Raj S, Balachandran S, George GJ, Sudarsan KS, Ranjeet K and Sankar TV (Eds) 2019 Book of Abstracts AQUABE 2019: International Conference on Aquatic resources and Blue Economy, 206p.



5. **BasimBasheer, Suriyakala C D,** "Underwater Safety " in Ocean Process and Environmental Impact" In Raghavan R., LimnaMol VP, John EM, Raj S, Balachandran S, George GJ, Sudarsan KS, Ranjeet K and Sankar TV (Eds) 2019 Book of Abstracts AQUABE 2019: International Conference on Aquatic resources and Blue Economy, 206p.
6. **MerinSkariah, Suriyakala C D** "An exploration on Flood Forecasting Techniques and their Applications", In Raghavan R., LimnaMol VP, John EM, Raj S, Balachandran S, George GJ, Sudarsan KS, Ranjeet K and Sankar TV (Eds) 2019 Book of Abstracts AQUABE 2019: International Conference on Aquatic resources and Blue Economy, 206p.
7. **Afsal E.M** (2019). Blue Economic Resources: Prospects and Challenges for India and ASEAN State', In Raghavan R., LimnaMol VP, John EM, Raj S, Balachandran S, George GJ, Sudarsan KS, Ranjeet K and Sankar TV (Eds) 2019 Book of Abstracts AQUABE 2019: International Conference on Aquatic resources and Blue Economy, 206p.
8. **Afsal E.M** (2020). Technology Adoption, Growth and Human Resource Accumulation: A Study of Banks, Seventeenth AIMS International Conference on Management organized by AIMS International - The Association of Indian Management Scholars International and Indian Institute of Management Kozhikode at IIM Kozhikode during 2020 January 2-4 .
9. **CS Viji, P.Bimal, AS Shara, C.LinoyLibini and T.V.Sankar,** 2019. Nursery rearing of *Peneusmonodon* (Fabricius) and *Litopenaeusvannami* (Boone) in the recirculatory aquaculture system, In Raghavan R., LimnaMol VP, John EM, Raj S, Balachandran S, George GJ, Sudarsan KS, Ranjeet K and Sankar TV (Eds) 2019 Book of Abstracts AQUABE 2019: International Conference on Aquatic resources and Blue Economy, 206p.
10. **S. J. Laly ,T. V. Sankar** and Satyen Kumar Panda, 2019. Identification of allergic proteins if Kiddi shrimp (*Parapenaeopsisstylifera*) and characterisation by mass spectrometry, , In Raghavan R., LimnaMol VP, John EM, Raj S, Balachandran S, George GJ, Sudarsan KS, Ranjeet K and Sankar TV (Eds) 2019 Book of Abstracts AQUABE 2019: International Conference on Aquatic resources and Blue Economy, 206p.
11. **NehaOmgy and T.V.Sankar,** 2019 Nutritional quality of edible crab species from Kochi, Kerala, , In Raghavan R., LimnaMol VP, John EM, Raj S, Balachandran S, George GJ, Sudarsan KS, Ranjeet K and Sankar TV (Eds) 2019 Book of Abstracts AQUABE 2019: International Conference on Aquatic resources and Blue Economy, 206p.
12. **Jayashree RC, Subashchandran KP and T.V.Sankar,** 2019, Screening of plastics degrading microorganism isolated from different environmental sources, , In Raghavan R., LimnaMol VP, John EM, Raj S, Balachandran S, George GJ, Sudarsan KS, Ranjeet K and Sankar TV (Eds) 2019 Book of Abstracts AQUABE 2019: International Conference on Aquatic resources and Blue Economy, 206p.
13. **Vishnu Murali, Princy M John, Hrishikesh P, Prabhakaran MP, KunalChakraborty, Aneesh A, Lotliker and Anu Gopinath.** Macro nutrients and dissolved oxygen distribution from nearshore to offshore waters off Kochi, Presented a Poster - Iasc 2019-
14. **Vishnu Murali, Princy M John, P1 Athira P K ,PriyaVargheese, Ignatious Joseph Prabhakaran M P, KunalChakraborty, Aneesh A Lotliker and Anu Gopinath.** Influence of upwelling on apparent oxygen utilization (AOU) and nutrients in the offshore waters off Kochi. Presented a poster - **Maricon 2019**, School of Marine Sciences, CUSAT, Kochi - 682016, Kerala, India.
15. **Athira P K1, Vishnu Murali, Ignatious joseph, Princy.M. John, Priya Varghese, M P Prabhakaran, Anu Gopinath.** Biochemical composition of dissolved and particulate organic matter upto 100m depth profile in off Kochi, Poster - **Maricon 2019**, School of Marine Sciences, CUSAT, Kochi - 682016, Kerala, India.
16. **Athira P K, Princy.M. John, Priya Varghese, Vishnu Murali, Anu Gopinath.** Quality assessment of sedimentary biochemical composition off Kochi. Poster- Sixth Biennial Conference of Ocean Society of India, OSICON – 19, Centre for Marine Living Resources and Ecology (CMLRE), Kochi - 682508, KERALA
17. **Jennees Mathew and Anu Gopinath.** Lead and Iron binding capacity of humic acids from Kerala Mangroves, Poster presentation –best poster award, **Maricon 2019**, School of Marine Sciences, CUSAT, Kochi - 682016, Kerala, India.
18. **Jitha G, Jennees Mathew and Dr.Anu Gopinath.** Isolation and characterization of humic acids from arctic fjord sediments and subsequent application in the removal of chromium from aqueous solutions, **Maricon 2019**, School of Marine Sciences, CUSAT, Kochi - 682016, Kerala, India.
19. **DivyaHaridas and Devika Pillai** (2019). N-Acyl homoserine lactone degrading *Bacillus* strains isolated from fish culture pond soil. Presented in AQUABE, Organized by KUFOS at Kochi, Nov. 28-30, 2019.
20. **Sneha, K.G. and Devika Pillai** (2019). Identification of carbapenem and extended spectrum B-lactamase resistance genes in *K. pneumoniae* and *E. coli* in public water bodies in Kerala: Evidence of horizontal spread of antimicrobial resistance. Presented in AQUABE, Organized by KUFOS at Kochi, Nov. 28-30, 2019.
21. **Bini C. Das, Nithin, Arunendu, Anvar Ali, DivyaHaridas and Devika Pillai** (2019). Recent EUS outbreak in the flood affected fish farms of Kerala. Presented in AQUABE, Organized by KUFOS at Kochi, Nov. 28-30, 2019.

## Participation of KUFOS Officers and Students in various programmes

**Dr.A.Ramachandran**, Vice Chancellor **Dr.T.V.Sankar**, Director of Research and **Dr.K.Dinesh**, Aquaculture Dept Head have visited M/s Camimex, Ca Mao, Vietnam to participate in the fact finding mission on the reproduction of organic black tiger shrimp to Vietnam along with the Vice Chancellor, Dr. Dinesh during 6 – 8 Oct 2019. The programme was technically facilitated by Mr. Gerald Zurlutter, Head of Projects & Overseas Buying Frozen products COOP Cooperative, Switzerland.



**Dr.A.Ramachandran**, Vice Chancellor attended the Refcold India 2019 three day exhibition cum conference on cold chain, industrial refrigeration and Reefer Transportation held at Hyderabad from 21st to 23rd November 2019 and gave a talk on "Future of Blue Economy" -sustainable use of Ocean Produce for economic growth.

**Dr.A.Ramachandran**, Vice Chancellor attended the 44<sup>th</sup> Vice Chancellors Convention of IAUA at Indira Gandhi Krishi Viswa Vidyalaya, Raipur FROM 12<sup>th</sup> TO 13<sup>th</sup> December 2019.

**Dr.T.V.Sankar**, Director of Research, participated in the National Seminar organised by MSTM Arts and Science College, Perinthalmanna on "Awareness on the current scenario on food processing and food safety issues" on 12th Oct 2019 and gave an invited talk "Food Safety Issues with Reference to Food Product

**Dr.T.V.Sankar**, Director of Research participated in the awareness meeting cum press meet on 16th October 2019, marking the culmination of our month long (15th September – 15th October) activities on Swachata Hi Seva, organised by KUFOS.

**Dr.T.V.Sankar**, Director of Research participated in the Joint radoprogramme "Kadal Kadalolam" organised by All India Radio and KUFOS on 22 November 2019 and gave a live programme on the *Status and prospects of Fisheries Research in the Country*. as prelude to the International Conference on Aquatic resources and Blue economy organised by KUFOS during 28-30 November 2019.

**Dr.T.V.Sankar**, Director of Research invited as Guest of Honour for the inaugural function of the International Conference on "Business Management, Economics and technology in the Digital Era, organised by the Lead College of management, Dhoni, Palakkad.

**Prof. S. Rajendran**, Adjunct Professor, Department of Earth Sciences delivered an Invited Lecture on Prospects and Challenges in Mining of the Onshore and Offshore Mineral Deposits of Kerala, the Gas Hydrates within the EEZ and the Manganese Nodules beyond the EEZ in the International Conference, Aquabe2019 organised by KUFOS during November 28-30, 2019.

**Amrutha R Krishnan**, Assistant Professor, Department of Fish engineering delivered an invited talk on "Power transfer to fish is a function of electric conductivity of water and fish" in Third International Conference on Advanced Materials (ICAM 2019)

**Amrutha R Krishnan**, Assistant Professor, Department of Fish Engineering chaired two sessions, Session Nanocomposites & Session Environmental Remediation in Third International Conference on Advanced Materials (ICAM 2019)

**Amrutha R Krishnan**, Assistant Professor, Department of Fish engineering participated and presented a poster on "Migratory Fishes In Winter Migratory Coastal Set Bagnets Of Hooghly – Matlah Estuary in AQUABE 2019

**Susamma A.P**, Director of Planning, KUFOS has participated in the 24<sup>th</sup> International Conference on Advanced Materials and Nanotechnology held at **Rome, Italy** during 21 – 22 October 2019 and presented a paper entitled "*Studies on Natural Rubber Nanocomposites by Incorporating Amine Functionalised Graphene Oxide*".

**Dr.GirishGopinath**, Associate Professor, School of Fishery Environment has delivered an invited talk on "Application of Geospatial Technology in Water Resources Management" on 12<sup>th</sup> October 2019 in connection with Pre Conference workshop on "Synergic Management of Water Resources in Changing Climate" organized by Association of Hydrologist India (AHI) held at CSIR-NCRI, during 12-13 October, 2019, Hyderabad, Telangana

**Dr.GirishGopinath**, Associate Professor, School of Fishery Environment has delivered a talk on Disaster Management Situations arising out of rampant Sea Erosions" on 4<sup>th</sup> December 2019 in connection with two days seminar on "Disaster Management" organized by Kerala State Productivity Council in association with Ernakulam District Administration and with the support of Factories & Boilers Department, Govt. of Kerala held at Productivity House, during 3<sup>rd</sup> & 4<sup>th</sup> December 2019, Ernakulam, Kerala.

**Dr.GirishGopinath**, Associate Professor, School of Fishery Environment has delivered an Invited talk on "Application of Geospatial Technology for Integrated Watershed Management" in connection with 12 days DST training programme on "Advances in Integrated



Watershed Management for Rural Livelihood” on 12 December, 2019 at ICAR-Indian Institute of Soil and Water Conservation, Research Centre, Ootty, Tamil Nadu.

**Dr. Girish Gopinath**, Associate Professor, School of Fishery Environment has delivered the Keynote address in Technical Session: Remote Sensing Applications in Earth System Sciences on 19<sup>th</sup> December 2019 in connection with an International Conference on Frontiers in Marine Science – Challenges and Prospects [MARICON 2019] during December 16-20, 2019 organized by Cochin University of Science and Technology (CUSAT), Kochi-16, Kerala.

**Dr. Girish Gopinath**, Associate Professor, School of Fishery Environment has served as an External examiner (2019) for Ph.D Degree under the faculty of Environmental Studies, Cochin University of Science and Technology titled Estimation of Biophysical Parameters of Tropical Forest Using Optical and LiDAR Remote Sensing Techniques: A Case Study from Western Ghats of India' on 01<sup>st</sup> November 2019 at School of Environmental Studies, CUSAT, Kochi.

**Dr. Girish Gopinath**, Associate Professor, School of Fishery Environment has served as an External Member in the Selection Board for a Junior Research Fellow (JRF) in a DST-NRDMS funded on 28th October 2019 at School of Marine Sciences, Cochin University of Science and Technology (CUSAT).

**Dr. Girish Gopinath**, Associate Professor, School of Fishery Environment has attended 2<sup>nd</sup> Triennial Congress of Federation of Indian Geoscience Congress (FIGA) / 37<sup>th</sup> Annual Convention on Water Resources Management under Changing Environment and Climate is being organized during 13 – 16 October, 2019 at CSIR NGRI, Hyderabad.

**Dr. C. Justin David**, Asst. Professor, School of Ocean Science and Technology has participated and presented 3 abstracts/ posters entitled “ Diet induced obese zebrafish model for identifying therapeutic targets of human obesity” and “Endocrine Disruptor Tributyltin induces hepatotoxicity in zebrafish” and “Zebrafish a novel tool in regeneration biology” in the International Conference AQUABE 2019 conducted by KUFOS on November 28-30, 2019 at Kochi.

**Dr. Resmi. P**, Post-Doctoral Fellow, School of Ocean Science and Technology has participated in Maricon 2019 held at Cusat and made an oral presentation on “antioxidant and alpha amylase activity of chloroform fraction and profiling of nitrogenous compounds from the bark of mangrove plant *Rhizophora mucronate*

**Vishnu Murali**, Research Fellow, School of Ocean Science and Technology, KUFOS has presented a Poster -Iasc 2019- macro nutrients and dissolved oxygen distribution from shore to offshore waters off kochi - an evaluation over a period of six months authored by **Vishnu Murali**, Princy M John, Hrishikesh P, Prabhakaran M P, Kunal Chakraborty, Aneesh A Lotliker, Anu Gopinath

**Vishnu Murali**, Research Fellow, School of Ocean Science and Technology, KUFOS has presented a poster -**Maricon 2019**- influence of upwelling on apparent oxygen utilization (aou) and nutrients in the offshore waters off Kochi an evaluation over a period of six month authored by **Vishnu Murali**, Princy M John, Athira P K, Priya Vargheese, Ignatious Joseph Prabhakaran M P, Kunal Chakraborty, Aneesh A Lotliker, Anu Gopinath

**Vishnu Murali**, Research Fellow, School of Ocean Science and Technology, KUFOS has presented a poster **Maricon 2019**- biochemical composition of dissolved and particulate organic matter upto 100m depth profile in off kochi authored by Athira P K 1, **Vishnu Murali**, Ignatious joseph, Princy.M. John, Priya Vargheese, M P Prabhakaran, Anu Gopinath

**Vishnu Murali**, Research Fellow, School of Ocean Science and Technology, KUFOS has presented Poster-**Ocicon 2019**- Quality assessment of sedimentary biochemical composition off Kochi authored by Athira P K, Princy.M. John, Priya Vargheese, **Vishnu Murali**, Anu Gopinath.

**Princy M John**, Ph.D Student, School of Ocean Science and Technology, KUFOS has presented a Poster -Maricon 2019- influence of upwelling on apparent oxygen utilization (aou) and nutrients in the offshore waters off kochi an evaluation over a period of six month authored by Vishnu Murali, **Princy M John**, Athira P K, Priya Vargheese, Ignatious Joseph Prabhakaran M P, Kunal Chakraborty, Aneesh A Lotliker, Anu Gopinath

**Princy M John**, Ph.D Student, School of Ocean Science and Technology, KUFOS has presented a Poster -**Maricon 2019**- biochemical composition of dissolved and particulate organic matter upto 100m depth profile in off kochi authored by Athira P K 1, Vishnu Murali, Ignatious joseph, **Princy.M. John**, Priya Vargheese, M P Prabhakaran, Anu Gopinath

**Princy M John**, Ph.D Student, School of Ocean Science and Technology, KUFOS has presented a Poster-**Ocicon 2019**- Quality assessment of sedimentary biochemical composition off kochi, Anu Gopinath.

**Athira P.K**, Research Fellow, School of Social Science and Ocean Technology has presented a Poster at **Ocicon 2019**- Quality assessment of sedimentary biochemical composition off Kochi authored by **Athira P.K**, Princy.M. John, Priya Vargheese, Vishnu Murali, Anu Gopinath.

**Athira P.K**, Research Fellow, School of Social Science and Ocean Technology has presented a Poster at **Maricon 2019**- biochemical composition of dissolved and particulate organic matter upto 100m depth profile in off kochi authored by **Athira P.K** 1, Vishnu Murali, Ignatious joseph, Princy.M. John, Priya Vargheese, M P Prabhakaran, Anu Gopinath

**Athira P.K**, Research Fellow, School of Social Science and Ocean Technology has presented a Poster at **Maricon 2019**- influence of upwelling on apparent oxygen utilization (aou) and nutrients in the offshore waters off kochi an evaluation over a period of six month authored by Vishnu Murali, Princy M John, **Athira P K**, Priya Vargheese, Ignatious Joseph Prabhakaran M P, Kunal Chakraborty, Aneesh A Lotliker, Anu Gopinath

**Ignatious Joseph**, Research Fellow, School of Social Science and Ocean Technology has presented aPoster at **Maricon 2019**- biochemical composition of dissolved and particulate organic matter upto 100m depth profile in off kochi authored by Athira P K1, Vishnu Murali, **Ignatious joseph**, Princy.M. John, Priya Varghese, M P Prabhakaran, AnuGopinath

**IgnatiousJoseph**,Research Fellow, School of Social Science and Ocean Technology has presented aPoster at **Maricon 2019**- influence of upwelling on apparent oxygen utilization (aou) and nutrients in the offshore waters off kochi an evaluation over a period of six month authored by Vishnu Murali, Princy M JohnP, Athira P K ,PriyaVarghese, **IgnatiousJoseph**Prabhakaran M P, KunalChakraborty, Aneesh A Lotliker , Anu Gopinath

**Priya Varghese**, Research Fellow, School of Social Science and Ocean Technology has presented aPoster at **Maricon 2019**- biochemical composition of dissolved and particulate organic matter upto 100m depth profile in off kochi authored by Athira P K1, Vishnu Murali, Ignatious joseph, Princy.M. John, **Priya Varghese**, M P Prabhakaran, AnuGopinath

**PriyaVarghese**, Research Fellow, School of Social Science and Ocean Technology has presented aPoster at **Maricon 2019**- influence of upwelling on apparent oxygen utilization (aou) and nutrients in the offshore waters off kochi an evaluation over a period of six month authored by Vishnu Murali, Princy M JohnP, Athira P K ,**PriyaVarghese**, Ignatious Joseph Prabhakaran M P, KunalChakraborty, Aneesh A Lotliker , Anu Gopinath

**Priya Varghese**, Research Fellow, School of Social Science and Ocean Technology has presented aPoster at Presented a Poster-**Ocicon 2019**- Quality assessment of sedimentary biochemical composition off Kochi authored by Athira P K, Princy.M. John, **Priya Varghese**, Vishnu Murali, Anu Gopinath.

**Jitha G**, Post-Doctoral Fellow, School of Ocean Science and Technology, presented a Poster at **Maricon 2019** - Isolation and characterization of humic acids from arctic fjord sediments and subsequent application in the removal of chromium from aqueous solutions authored by **Jitha G**, Jennees Mathew, Dr. AnuGopinath

**Dr. Suriyakala C D**, Director of School of Ocean Engineering and Underwater Technology has delivered an invited talk on the topic "Electronic monitoring and sensors in fisheries in the ICAR sponsored Short Course on "Recent advances in post-harvest fisheries engineering" held at CIFT Cochin during 13-22 November 2019

**Dr. Suriyakala C D**, Director of School of Ocean Engineering and Underwater Technology has delivered an invited talk in a workshop on Wireless Technology & RF Receivers Workshop at Bharath Electronics Ltd, Bangalore during 20-23 December 2019.

**Dr.LinuSalim and Er.Bhavya Francis**, Faculty Members of School of Ocean Engineering and Underwater Technology attended ICAR sponsored Short Course on „Recent advances in post-harvest fisheries engineering" during 13-22 November 2019 at CIFT Cochin .

## ACHIEVEMENTS.....

### KUFOS Fellows selected for 11<sup>th</sup> Southern Ocean Expedition



Dr. Gireesh Raghavan, Project Scientist, Center for Aquatic Resource Management and Conservation of KUFOS and Ms. Princy M John, Ph.D Scholar working under Dr. Anu Gopinath, School of Ocean Science and Technology have been selected for the 11<sup>th</sup> edition of the Southern Ocean Expedition (SOE 11). The 50 days long expedition is organized by National Center for Polar and Ocean Research (NCPOR), Goa. The scientific expedition team consisting of 45 researchers from famous National Laboratories commenced the sailing from Port Luis, Mauritius on 10.01.2020. The team from KUFOS will study on Salp-Cnidarian-Ctenophore trophodynamic interactions on the krill centred ecosystem in the Indian Ocean sector of Southern Ocean during Austral summer and its possible impacts on carbon cycle. The project is lead by Dr. V.N Sanjeevan (Former Director, CMLRE, Kochi) presently working as Professor Chair, Centre for Aquatic Resource Management and Conservation in KUFOS, Dr. T.V Sankar, Director of Research, Dr. Anu Gopinath and Dr. Gireesh Gopinath (Faculty Members, KUFOS).

### KUFOS Research scholar wins International travel grant award to Vietnam



**Rubeena K.A, PhD scholar**, School of Ocean Science and Technology, working under the guidance of Dr. E.P Preetham, has won the UK - Vaccinology network fully funded travel grant award to attend the International Veterinary Vaccinology Network Conference 2020, hosted in partnership with Cirad and the National Institute of Veterinary Research, to be held on the 16th – 18th March 2020 in The Melia Hotel, Hanoi, Vietnam

**Rubeena K.A** has also won the First prize in poster presentation at the AQUABE-19 International conference held at Kochi during 28<sup>th</sup> to 30<sup>th</sup> November, 2019, organized by Kerala University of Fisheries and Ocean Studies, Panangad, Kochi, Kerala. She presented her work on "Enhanced Antimicrobial Activity Of Lectin Conjugated With Copper Nanoparticles and Its Application In Aquaculture"



## Best Paper / Poster presentation Awards.....



**Hani Mohandas P.M**, Research Fellow with School of Ocean Science and Technology (SOST) and Dr.Jayalakshmi K.J, Asst Prof., Department of Fisheries Resources Management, KUFOS have won Best presentation award for their presentation (Seasonal variability of Planktonic standing stock in the Ashtamudi estuary) in the International Conference on Frontiers in Marine Science (MARICON – 2019) held at Cusat during 16 -20 December, 2019.



**Sr.Janees Mathew**, Ph.D Student in Marine Chemistry and Dr. Anu Gopinath (Asst. Professor, School of Ocean Science and Technology), KUFOS has won the Best Poster Award for their Poster presentation (Lead and Iron binding capacity of humic acids from Kerala Mangroves) in the international seminar on Frontiers in Marine Science- MARICON-2019 held at Cusat during Dec 16-20, 2019.



**Dr.Sreeja Lakshmi**, DHR-Research Scientist, School of Ocean Science and Technology, won the First Prize in poster presentation at the MARICON-2019, International Conference held at Cochin University of Science and Technology, Kochi, Kerala. Dr.Sreeja presented her work on “*Biomedical Prospects of Marine Derived Compounds As Therapeutics InAlzheimers Disease*”.

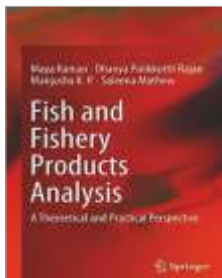


**Regina K.B.**, PhD student, Dept of Aquatic Animal Health Management has won the Second Prize for Best Oral Presentation for the paper entitled “Bacterial mixture from seafood processing effluent as a biocontrol agent against parasitic isopod” in National Conference on Molecular tools and Disease Diagnosis” in Sahrdaya College of Engineering and Technology, Kodakara, Kerala, October 3-5, 2019

## Books published by Faculty Members



**Dr Anu Gopinath** (Assistant Professor, Department of Aquatic Environment Management, KUFOS), **DrResmi P and Dr.Jitha G** (Postdoctoral Fellows, SOST)(2019) “**Soil and Water Chemistry**” for the Bachelor of Fisheries Programme, Semester I. Vishal Publishing Co, Jalandhar, ISBN No.978-93-89292-17-6..



Mathew, S., **Maya Raman** (Associate Professor, SOST)Rajan, D.P., and Parmeswaran, M.K. (2019). **Fish and Fishery Products Analysis: A Theoretical and Practical Perspective**. Springer Publications.SBN 978-981-32-9573-5 <https://doi.org/10.1007/978-981-32-9574-2>

## Upcoming event

### Convocation bell rings at KUFOS

The sixth convocation of the Kerala Fisheries and Ocean Science University (KUFOS), the first fisheries and ocean science university in the country will be held on 06 February, 2020 at 11 am at the Panangad main Campus of KUFOS

Hon'ble Governor of Kerala and Chancellor of KUFOS ShriArif Mohammed Khan will inaugurate the function and deliver the convocation address, which will be presided over by J.MercykuttyAmma, Minister Fisheries, Harbour Engineering, Cashew industry and Pro Chancellor of KUFOS. Totally 293 successful Under Graduate and Post Graduate students will be conferred degrees in the convocation, who have completed their courses in 2018-2019 academic year in different disciplines related to fisheries and ocean science. Gold Medals to 21 meritorious students who secured first rank in their courses and two Endowment awards will also be presented in the function. KUFOS Vice Chancellor Dr. A.Ramachandran will welcome the gathering and present annual report. KUFOS Governing Council members Sri.E.T.Taison MLA, Adv.A.N.ShamseerMLA, Senate Member Adv.M.Swaraj MLA, Sri John Fernandez MLA and Sri.Hibi Eden MP will deliver special addresses in the convocation. Dr.B.Manoj Kumar, Registrar of the University will propose a vote of thanks.

### Details of awarding degrees in various subjects

Out of 293 degrees are awarded, 52 are Bachelor Degrees in Fisheries Science (B.F.Sc). All other degrees awarding in the convocation are Post Graduate Degrees which include 38 MBA, 150M.Sc, 08 M.Tech, 36M.F.Sc, and 09 LLM (Maritime Law).

(Program details of 6th Convocation is printed on is on the back page)



# 6<sup>th</sup> CONVOCATION

6<sup>th</sup>  
February  
2020



KERALA UNIVERSITY OF FISHERIES AND OCEAN STUDIES  
**KUFOS**

PANANGAD, KOCHI - 682 506

Time	Event
11.00 am.	Welcome to His Excellency, the Governor of Kerala & Hon'ble Chancellor of Kerala University of Fisheries and Ocean Studies in the University premises
11.05 am.	Robing and Photo Session
11.15 am.	Academic procession
11.20 am.	National Anthem
11.21 am.	Floral welcome of the Guests by Hon'ble Vice Chancellor and Lighting of the lamp by His Excellency and Hon'ble Chancellor
11.24 am.	Declaration to open the Sixth convocation by His Excellency, the Governor of Kerala & Hon'ble Chancellor of KUFOS
11.25 am.	Presentation of the Annual report and welcome address by Prof(Dr) A. Ramachandran, Vice Chancellor, KUFOS
11.40 am.	Special Address by Shri. John Fernandez, MLA
11.42 am.	Special Address by Adv. A. N. Shamseer, MLA & GC Member
11.44 am.	Special Address by Shri. E. T. Taison Master, MLA & GC Member
11.46 am.	Special Address by Adv. M. Swaraj, MLA
11.49 am.	Special Address by Shri. Hibi Eden, MP
11.52 am.	Presidential address by <b>Smt. J. Mercykutty Amma</b> , Hon'ble Minister for Fisheries, Harbour Engineering and Cashew Industry, Govt. of Kerala and Pro-Chancellor of KUFOS
11.57 am.	Conferment of the Degree by <b>Shri. Arif Mohammed Khan</b> Hon'ble Governor & Chancellor of KUFOS
12.08 pm	Administration of the pledge by Hon'ble Governor & Chancellor
12.10 pm.	Distribution of medals and awards by Hon'ble Governor & Chancellor
12.15 pm.	Convocation address by Hon'ble Governor & Chancellor Hon'ble Chancellor's signature for the record of conferred degrees
12.29 pm.	Declaration to close the convocation by Hon'ble Governor & Chancellor
12.30 pm.	National Anthem
12.32 pm.	Return of Academic procession