



KERALA UNIVERSITY OF FISHERIES AND OCEAN STUDIES
(KUFOS)

PANANGAD, KOCHI



DIRECTORATE OF EXTENSION

**REPORT ON THE EXTENSION ACTIVITIES
OF THE DIRECTORATE OF EXTENSION (2019-20)**

Funded by Government of Kerala



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1. Introduction

In many instances, lack of awareness about the improved technology acts as a major constraint in the adoption of various practices, hindering the development of the concerned sector. Tremendous developments are taking place in many fields and transfer of the same to the stakeholders quickly in an efficient manner is imperative for the progress of the country. In this context, extension, the vital link connecting the technological development with the production system plays a crucial role.

Fisheries sector has witnessed tremendous developments both in aquaculture and marine capture. Though so many institutions, State/Central/NGO's are engaged in the transfer of various technologies aimed at the development and welfare of the fish farmers and fisher folk, it has not yet reached to the desired extent as envisioned. Despite their efforts, fisheries sector continues to be one of the most backward areas. One of the remedies is to strengthen the extension services to the community. Taking into account of these aspects, Kerala University of Fisheries and Ocean Studies (KUFOS) has implemented various extension projects aimed at the total development of the fisheries sector. These projects have helped in creating mass awareness about the various technologies in the field of fisheries, augmenting the fish production and protein supply to the community by adopting innovative aquaculture practices in an eco-friendly and sustainable manner, creating more employment opportunities in the concerned field, leading to an increase their income and improvement in the quality of life, thus ensuring livelihood security to them.

2. Extension Projects

Directorate of Extension, Kerala University of Fisheries and Ocean Studies (KUFOS) has implemented the following Plan Projects funded by Government of Kerala during the year 2019-2020

I. Village Adoption for Empowerment and Capacity Building Ensuring Livelihood of Fisherfolk in Central Kerala

Kerala University of Fisheries and Ocean Studies (KUFOS) is implementing the Plan Project “Village Adoption for Empowerment and Capacity Building Ensuring Livelihood of Fisher folk in Central Kerala” from the year 2015 onwards. The major objectives of the project are promoting diversified aquaculture practices and allied activities in an eco- friendly and sustainable manner so as to increase the fish production of the State, creating more employment opportunities to the fish farmers and fisher folk, thus ensuring livelihood security to them. The project also focuses on transfer of post-harvest technologies to the target group with a view to ensure better quality products both for domestic and export market and helps in providing gainful employment by establishing small scale units along the coastal area. While promoting these activities special

emphasis is being given for women empowerment also. As part of the project the following training programmes were conducted

a. Training programme on “Seed Production and Farming Strategies of Pearls spot” from 29/10/2019 to 31/10/2019

A Training programme on “Seed Production and Farming Strategies of Pearls spot was organized at KUFOS from 29/10/2019 to 31/10/2019. Dr. Daisy. C. Kappen, Director of Extension welcomed the dignitaries and farmers. The programme was inaugurated by Prof. (Dr.) A Ramachandran, the honourable Vice Chancellor of KUFOS in the presence Dr. B. Manojkumar, Registrar, Dr. K. Gopakumar, Professor of Eminence, Dr. T V Sankar, Director of Research, Dr. Riji John, Dean, Faculty

of Fisheries and Sri Joby George, Finance Officer. Scientists both from KUFOS and CMFRI and a successful farmer Sri.Vineesh, Puthenthura, Karimeen Hatchery, Udayanapuram who is in the field of breeding and farming of pearlspot for the last 20 years engaged classes to the farmers on various topics viz. Basic principles of aquaculture, Seed production of pearlspot in tanks, Cage culture of pearlspot, Pen culture of pearlspot, Preparation of artificial feed, Fish diseases and remedial measures. A field trip to Puthenthura Karimeen hatchery was also organized on the last day. Altogether 30 farmers attended the training programme

*Welcome speech by
Dr. Daisy.C.Kappen, PI of the project*



Participants of the training programme



b.Training Programme on “Advanced Techniques in Aquaculture” from 18/2/2020 to 20/2/2020

A three day training programme on “Advanced Techniques in Aquaculture” was organized at KUFOS from 18/2/2020 to 20/2/2020. Dr. Daisy. C. Kappen, Director of Extension welcomed the dignitaries and farmers. The programme was inaugurated by Prof.(Dr.) A Ramachandran, the honourable Vice Chancellor of KUFOS in the presence Dr. B. Manojkumar, Registrar, Dr. T V Sankar Director of Research, and Sri. Joby George, Finance Officer and Dr. K Dinesh, HOD, Department of Aquaculture. Scientists both from KUFOS and CMFRI including a successful farmer Sri.Vineesh, Puthenthura Karimeen Hatchery, Udayanapuram engaged classes to the farmers on various topics viz. fresh water fish farming,

*Prof.(Dr.)A Ramachandran, honorable
Vice Chancellor; KUFOS inaugurating
the training programme*



ornamental fish culture, brackishwater shrimp/vannamei culture, live feed culture, culture of indigenous fishes and their breeding, biofloc fish culture, seed production and culture of pearlspot, cage aquaculture, pen culture, aquaponics, preparation of artificial feed, fish diseases and remedial measures, and culture of GIFT Tilapia. A field trip to Puthenthura Karimeen hatchery, Vaikom was also organized on the last day. 39 farmers attended the training programme

Participants of the training programme



Visual Problem Appraisal(VPA) Kerala's Coast 2.0- Visit by Netherlands team at Flood effected villages adopted by KUFOS

Visual Problem Appraisal(VPA) is a film based learning strategy with ethnographic, deliberative and artistic aspects, which aims to enhance the problem analysis of complex issues and to facilitate the development of actions. VPA creates a space for social dialogue as it is made up of a series of filmed stakeholder portraits and accompanying documentaries. These can be used in diverse arenas such as in participatory process of policy development and/or implementation and education. VPA Kerala's Coast 2.0 provides new research data about livelihoods, coastal zone management and climate adaptation that could be combined with the data from original VPA Kerala's coast of 2003 already developed to support a longitudinal study about changing drivers, perspectives, roles and changes in the context of sustainability transactions. In University/College education, VPA Kerala's coast 2.0 could be used in BSc and Msc education about water governance, climate adaptation, development studies and maritime and coastal governance. It will help to familiarize with the learning strategy underlying the VPA and will provide an opportunity to work with the materials of VPA Kerala's Coast

to get a good feel what it implies to meet real stakeholders in a mediated way

As part of the VPA Kerala's Coast 2.0, a team from Netherlands, Miss Loes Witteveen and Mr. Jeroen Rijke visited two villages, Kottuvally and Thiruthipuramon on 26/9/2019 which were adopted by KUFOS under the plan project "Village adoption" and effected by flood during the year 2018. The team interacted with farmers and collected the details of fish farming including the losses occurred due to flood. The team reported to the honorable Vice Chancellor of KUFOS that they had been able to work very productively and the new theme on the floods turned out to address diverse aspects of disaster management. They appreciated the active approach taken by Dr. Daisy. C. Kappen, Director of Extension in implementing the project successfully in the field. Also expressed their gratitude for getting an opportunity to interview Dr. Daisy C.Kappen, the Implementing Officer of the out reach programme and also to interact with the farmers who suffered due to severe damages by floods and received both technical and moral support from KUFOS in restarting their enterprise. The team submitted proposals:-

- To use the VPA Kerala's Coast 2.0 in education at KUFOS, VHL and other Universities
- For follow up activities with VPA that support collaborative learning/governance in the public domain, such as workshops with stakeholders
- To develop new educational methods like MOOC

Netherlands team with the farmers in the field



Discussion with PI for the production of a film on "Effects of flood" during the year 2018 at Kottuvally



Directing the farmer for producing a film on "Effects of flood 2018" for VPA



Interviewing Dr.Daisy .C.Kappen, PI of the project "Village Adoption"



Seed collection Centre at Panangad

As the seeds of the pearlspot are naturally available in the backwaters of ward V of the Kumbalam Panchayath, for collecting the seeds and distributing the same to the other farmers, two plastic tanks of 1000 liter capacity was provided to Sri A A Satheerthan, Oranpozhiyil, Panangad. He is a successful farmer who has been doing both pen culture and cage culture for the last 10 years. Such an approach will serve as a partial solution to the scarcity of seeds for enhancing the fish production of the State and also motivate other farmers in starting pearlspot culture, the signature fish of Kerala.



Sri.A A Satheerthan receiving the plastic tanks for keeping the pearlspot seeds

Demonstration Unit Established at CIAL, Kochi

Golf Club, CIAL, Nedumbassery has approximately 3 acres of freshwater area having sufficient water throughout the year for promoting aquaculture activities. On the request of the officials working at Golf club, CIAL, Sri., Premkumar. T and Sri. Sunny Joseph who attended the training programme on “Seed Production and Farming Strategies of Pearlsport” organized at KUFOS from 29/10/2019 to 31/10/2019, a team of experts Dr. K Dinesh, Head of the Department of Aquaculture, Faculty of Fisheries, Dr. Anwar Ali P H, Asst. Professor, Department of Fisheries Resource Management, Faculty of Fisheries, Dr. Daisy. C. Kappen, Director of Extension i/c, KUFOS and Sri Saneer N S, Fishing Technology Assistant visited the CIAL Golf Club during the first week of November 2019 to know the prospects for promoting fresh water fish farming in this area. After site inspection, taking into consideration of the physical and chemical parameters and availability of water it was found that the site is suitable for promoting culture of fishes like pearlspot, GIFT tilapia, seabass, and carps. Out of the various types of fish farming, the practice of cage aquaculture of the above fishes has been identified as the most suitable one taking into consideration of management of various water quality parameters, detection of diseases if any, easy harvesting and marketing as per the market demand for ensuring better price etc. As the above officials from Golf club, CIAL expressed their interest in the culture of pearlspot, the signature fish of Kerala which is having high market demand as an esteemed table fish, the University agreed to conduct a demonstration of the cage aquaculture of pearlspot in this area. Three hundred numbers of pearlspot seed measuring 5-6cm were stocked in the cages of 3mx2mx2m size. Sampling and growth assessment shows better growth and survival rate and continuous monitoring of the same is being carried out.

Stocking of the pearlspot seeds in cages



Sampling of the stocked fishes



Fish Farmers Day celebrations- One day workshop “Popularizing Aquaculture- New Thoughts” on July 10th

It was in 2001 that the Government of India declared July 10 as Fish Farmers Day to honour scientists, Hiralal Choudhary, and Dr.K.H.Alikunjhi who successfully conducted induced - breeding in Indian major carps during the year 1957. Every year KUFOS is celebrating “Fish Farmers Day” in a befitting manner. During the year 2019 KUFOS celebrated “Fish Farmers Day” on 10/7/2019 by organizing a one day workshop on “Popularising Aquaculture-New thoughts”. The programme was inaugurated by the honorable Vice Chancellor of KUFOS Prof.(Dr.)A.Ramachandran and presided over by Dr. B.Manojkumar Registrar, KUFOS. Dr. Daisy. C. Kappen Director of Extension welcomed the gathering. Dr. T. V. Sankar, Director

of Research, Dr.Riji John Dean, Fisheries offered felicitations on this occasion.Scientists of KUFOS engaged classes to the farmers on various topics in aquaculture.

Honouring Satheerthian who has been in cage aquaculture and pen culture for the last 10 years



Certificate Distribution to the participants by honorable Vice Chancellor, KUFOS



II. Earn While You Learn programme (EWYL)

The concept of this programme is to develop entrepreneurship among the students undergoing various courses in the University. Aquaculture and allied subjects dominate in their curriculum and a thorough hands-on exposure in the field will enable them to understand the basic concepts through a more practical oriented approach, to prepare them as capable professionals and turn them to job creators than job seekers. This programme, apart from giving practical exposure, will also enable them to be self-sufficient, confident and efficient managers .Kerala University of Fisheries and Ocean Studies (KUFOS) is implementing this project by utilizing the infrastructure facilities available in the University.

Earn While You Learn Programme-Guidelines

Preamble : Earn While You Learn programme is envisaged to strengthen the link between learning process and field oriented farming practices. This will reinforce the instructional curricula discharge at class room on the one hand and lab to land on the other. It will also help to improve the farming practices by getting innovative ideas from the students (land to lab). This mechanism will help the students to acquire professional competency in the field of fisheries and allied areas.

- Students of KUFOS will be entrusted with this programme and it will be voluntary in nature. Participating students will be given certificate.
- Areas identified for Earn While You Learn Programme are
 1. Aquaculture- mono/polyculture variety species
 2. Integrated farming
 3. Cage/Penculture
 4. Ornamental Fish Culture
 5. Aquaponics
 6. Value addition
- The students will be grouped into batches of 10 each and each group can opt one of the above mentioned areas of activity
- Sales will be through Amenity Centre, KUFOS.
- Service of labourers can be availed during the period of the programme as per requirement
- Sixty percent of the profit generated through the programme shall be disbursed to the students.
- Remaining portion of the profit and input cost shall be refunded to the University.

- Periodic maintenance of the infrastructure facilities shall be done by the University
- The programme will be jointly implemented by the Directorate of Extension and school concerned
- There shall be a report authenticated by the monitoring committee.
- There shall be a stock register maintained by the faculty concerned, countersigned by the Director of the respective school.
- The programme shall be monitored by a committee consisting of the Director of Extension as the chairman and a faculty member as convener and one faculty nominated by the honorable Vice Chancellor. Director of the school concerned shall be an Ex-Officio member

During the year 2019-20, various activities of this Plan project were carried out through Department of Aquaculture and Fish Processing Technology of the Faculty of Fisheries and School of Ocean Science & Technology. The programme was entrusted to Dr. Binu Varghese, Assistant Professor, Department of Aquaculture, Faculty of Fisheries, Dr. Abhilash Sasidharan, Assistant Professor, Department of Fish Processing Technology, Faculty of Fisheries and Dr. S. Sureshkumar, Professor, School of Ocean Science & Technology as coordinators.

EWYL programme implemented by the Department of Aquaculture, Faculty of Fisheries during 2019-20 enabled capacity building and skill development among the B F Sc students, provided practical field exposure on various aspects of aquaculture and allied activities, enriched their entrepreneurship capabilities, developed an attitude for team work and dignity of labour, familiarized the ways of conducting market surveys and preparation of production plan for small scale projects integrating aquaculture, agriculture, aquaponics ,poultry, fish processing, etc. and also contributed to their personality and leadership development. It also helped in increasing their confidence and enhanced their ability to manage the aquaculture activities. Under this project, farm equipment and accessories required for carrying out various aquaculture activities were purchased, breeding and rearing of different fishes were carried out .Ongoing activities include

Rearing and seed production of Karimeen, *Etroplus suratensis*

Rearing of Red Tilapia

Seed production and rearing of Koi carp

Seed production of Giant Gourami

Culture of Stinging catfish and Climbing perch

Future activities include seed production of fishes and culture of high value fishes like seabass and pearlspot. PI of the programme reported that there was heavy loss due to predation and otters attack during the year 2019-20. Losses of stock worth more than Rs.1,00,000/- accounted which includes entire brood stock (30 no's) of Giant Gourami aged 2-8 years due to predation by River Otters (Rs.60,000/-) and about 400 number of 1 ½ year old quality koi carps (Rs 40,000/-) due to poor water quality. Unavailability of the students during the vacation and examination time acts as a major constraint in the proper implementation of the project which can be overcome by availing the service of the farm labourers and steps are being taken for the same. Rescheduling the academic timing in colleges from 8.30 to 13.30 and engaging the students in the afternoon can also be considered for the same. Similarly, allocating 2 ponds already renovated in the western campus will also lead greater output and better performance. Expenditures incurred in the project is Rs. 46,347/- and Income generated is Rs. 77,975/- (Rs. 74,840/- +interest Rs. 3,135). Now students who are the part of EWYL are encouraged to start their own farming and also assist local self-government in fish culture. Steps are being taken to overcome the above constraints and to strengthen the programme with the active participation of students.

The EWYL programme implemented by the Department of Fish Processing Technology under the Faculty of Fisheries provided an opportunity for the students in acquiring the required skill and knowledge regarding various aspects of seafood processing technology and enabled them to understand the basic concepts through a more practical oriented approach. It also equipped them with the basic skills required for entrepreneurship in different fields of seafood processing industry and provided an

opportunity to generate income from their own practical venture. The University has adequate infrastructure required for the successful implementation of the programme viz. production of seafood by-products, biochemistry and microbiology laboratories. The students were divided into different groups and each group was given orientation on raw material procurement, product development, quality assurance, packaging and marketing. They were encouraged to develop their own recipe and to conceptualize unique packaging and marketing options. Through this each student, besides learning the basic principles of fish processing technology also earns the tactical techniques involved in seafood based entrepreneurship and income generation. Under this programme, BFSc 2016 batch students were trained in the preparation of value-added products like fish/prawn pickles, fish/prawn cutlets, chilled fish/prawn dry, ready to cook and eat products etc. and marketing. The technology of preparation of these products were also standardized for transferring them to the people interested fish processing.

For the 2015 batch BFSc students, an awareness program regarding Earn While You Learn programme was organized. One of the major problems is that as it is not under the credit or non-credit scheme of their course, it is difficult to get

dedicated students to work for the program. The students have to work continuously to generate any profit. The plan envisaged is as follows:

1. The EWYLP fund is utilized for starting a sales counter at the Amenity Center. The process of getting FSSAI certification is under progress and the application is submitted to the Kumbalam Panchayath for same. Once the license is received, a staff on contract or daily wages can be appointed for the management of the entire activities of production of value-added fishery products so as to ensure regular supply, handling the store room etc. Students can also be involved regularly in assisting activities and a share of the profit can be given to them on the basis of their contribution.

2. The EWYLP fund is also utilized in developing technologies and products which could be further utilized for income generation by involving interested students. A mini mussel deputation system and a mini spherification machine (for producing analog fish caviar) are developed and initiatives are taken in developing a drum smoker-cum-griller. These technologies after completing the IP formalities could be used to train students for income generation. The above technologies are developed as part of the thesis work of the MFSc students

III. Establishment of Farm Radio Station for Hastening Fisheries development in the State

Providing quick information at the right time to the stakeholders in the fisheries sector is indispensable for discharging their diversified activities both in the aquaculture and marine capture fisheries. Though tremendous developments have been made in the field of aquaculture and allied sectors, the technologies have not percolated to the fisherfolk and fish farmers to the desired extent. Lack of adequate knowledge about the various technologies still acts as a major constraint in the wide spread adoption of diversified practices in an eco-friendly and sustainable manner and efficient utilization of the vast resources in the State of Kerala. Transfer of technologies to the target group at a faster rate using appropriate media will help in the efficient utilization of the various fishery resources, augmenting fish production of the State, creating more employment opportunities to the fisherfolk who are facing problems as low catch, increased fishing effort etc. Similarly, the marine capture sector is also facing various challenges at present, of which the most important one is the more or less stagnant position of the Kerala State in marine fish production during the past few years due to over exploitation, juvenile fishing etc. Creating awareness about the responsible fisheries and need to conserve the fishery resources for the future generation is the need of the hour which requires urgent attention. In addition to these, both State and Central Government Agencies are involved in various types of welfare activities with the objective of the socio economic development of fisherfolk and fish farmers and providing both technical and financial support to them. Here also, lack of awareness about these assistance provided by different agencies acts as a major constraint in availing of benefits

from the concerned agencies. As the extension education focuses upon the overall development of the people, due attention should be given to their total development in all dimensions viz. financial, social, cultural, spiritual etc. For this, in addition to the dissemination of technologies, conducting value based cultural programmes, leadership and personality development programmes etc. are also required. Such programmes can be organized with the participation of the community which can be recorded, and broadcasted/telecasted later on for the benefit of the entire community. Besides these, KUFOS as part of the extension activities under various Plan Projects funded by Government of Kerala, is also conducting various programmes for the benefit of the community which can also be transferred. Towards fulfilling the above intentions, as part of the Plan Project "Farm Radio", an Audio Video Recording Studio has started functioning during the year 2018 onwards. Currently a Cameraman cum NLE Editor and a Production Associate are working in this project. The University Governing Council in its 59th meeting held on 27/12/2018 decided to rent out the facilities of the studio to other individuals/institutions etc. so as to generate some revenue to the University. As per this decision, Directorate of Extension is outsourcing the facilities and started creating income to the University. An amount of Rs.46,100/- (Forty six thousand and one hundred only) has been earned during the year 2019-20 by outsourcing the studio facilities. The following activities were carried out during the year 2019-20.



APRIL 2019

- Videography and photography of seed collection and harvesting of the pearlspot stocked in the ponds located near to the Type II quarters on 10/04/19 & 11/04/19.
- Videography of the AICTE inspection at KUFOS and editing on 13/04/19.
- Videography of KUFOS National Science day celebration by organizing one day seminar in association with Kerala State Council for Science, Technology & Environment, Govt. of Kerala on the focal theme "Science for the People, and People for the Science" and editing of the same on 17/04/19.
- Video and Photo session of MoU signing with COOP on 29/04/19.
- Video shoot at Puthenvelikkara on 30/04/19 for the production of a film on Cage aquaculture
- Photo session of the retirement of Dr. Victor George, Registrar and A V Thomas Office Superintendent on 30/04/19.

MAY 2019

- Videography of the renovation and cleaning of the pond in the Western Campus on 7/05/19 for the production of a short documentary on Vennamei shrimp farming
- Videography of the tea seed application in the pond for eradicating unwanted fishes on 07/05/19 for the production of the above film
- Videography of the dead fishes and insects floating in the pond on 08/05/19 for the production of the above film
- Editing of the video film of Soil and water samples collection at Kollam on 10/05/19.
- Videography of the Vennamei shrimp stocking in the pond on 18/05/2019
- Photography of the three days workshop on entrepreneurship development organized by Dr. Suresh Mallya at KUFOS seminar hall on 29th, 30th & 31st May 2019

JUNE 2019

- Voice recording of the Gorgonian Documentary on sea fans by Ramvilas Gosh (Ph D scholar) on 03/06/19.
- Photo session of the celebration of World environment day on June 5th 2019
- Photo session of the Ocean Modeling Workshop

for students and Research Scholars organized at KUFOS Head Quarters by Dr. S Sureshkumar on 11/06/19.

- Video shoot on collection of water, soil and froth developed at Kollam beach for conducting further studies at KUFOS as requested by Dr. S Sureshkumar and Dr. S. M. Raffi on 11/06/19.
- Photo session at Eriyad, Kodungalloor to study the disaster caused by the sea as part of the curriculum of the students undergoing P.G. in disaster management at KUFOS on 12/06/19.
- Voice recording of the Gorgonian Documentary on sea fans by Ramvilas Gosh (Ph D scholar) and editing on 14/06/19.
- Photo session of the one day workshop at language lab, MAT LAB conducted by Dr. Suryakala (SOEUT) on 17/06/19.
- Video shoot at seminar hall on World Yoga day and editing of the same on 21/06/19.
- Photo session of the boards installed in all the departments showing the details of the University Grievance Redressal cell constituted at KUFOS on 22/06/19.
- Gorgonian Documentary of Ramvilas Gosh (Ph D scholar) on sea fans -Video Editing at Studio on 26/06/19.

JULY 2019

- Photo session of the visit of the dignitaries from Kuwait to know the technical details of the Vannamei shrimp farming at KUFOS on 03/07/19.
- Photo session of the Fish farmer's day celebrations and one day seminar jointly organized by Aquaculture Dept. and Directorate of Extension on 10/07/19.
- Editing of the video shoot of the western campus lab on 16/07/19.
- Photography of all the display boards installed in the University campus on 20/07/19.
- Photo session of the visit of the dignitaries from Plymouth University, United Kingdom to know the technical details of the vannamei shrimp farming at KUFOS on 22/07/19.
- Editing of the University video film for uploading in the KUFOS website on 23/07/19.
- Fish farmer's day celebration and one day seminar - Video Editing on 23/07/19.
- Video shooting of the sampling of Vannamei shrimps stocked at western campus on 24/07/19.

- Rough video editing of the pond cleaning, application of tea seed, pond setting, seed stocking and sampling of the vannamei shrimp culture on 23/07/19.
- Voice re- recording of Gorgonian Documentary on sea fans by Ramvilas Gosh (PhD scholar) on 30/07/19.

AUGUST 2019

- Shoot and edit of oral presentations of PhD fellows for presenting in the 6th international conference on Fisheries and Aquaculture, conducted at Thailand on 08/08/19.
- Purchased equipment and other items required for the studio on 13/08/19.
- Photography of Independent day celebrations and flag hoisting on 15/08/19.
- Photography of orientation programme of the 2019 batch B.Tech Food Science & Technology students and GURUPUR SADANANDA PRABHU AWARD distribution to the students for excellence in food science and technology on 19/08/19.
- Photography of the visit of Dr. R Ramkumar (hon'ble member, Kerala State Planning Board) and Mr. Ignasious Manroe (Joint Director, State Fisheries Department) at KUFOS campus on 22/08/19.
- Photography of Laboratories of various Schools, Departments, playground and other facilities like seminar hall, gymnasium etc of the KUFOS for uploading the same in the ICAR Education portal on 26th, 27th & 29th August 2019.
- Photography of two day workshop on value added fish products jointly conducted by Center For Advanced Studies And Research In Entrepreneurship Development, KUFOS and Department of Fish Processing, KUFOS on 30th & 31st August 2019.
- Re-edited the documentary of Ramvilas Gosh (PhD scholar) on sea fans on 29th & 30th 2019.

SEPTEMBER 2019

- Photography of seminar conducted by Confederation of University Employees (KUFOS) on 03/09/19.
- Photography of two day National Workshop on KOHA. Jointly organized by Kerala University of Fisheries and Ocean Studies and Kerala Library Association on 04/09/19.

- > Photography of Onam celebrations conducted by Students Union on 05/09/19.
- > Photography of Onam celebrations conducted by staff association on 06/09/19.
- > Video shoot of Fisheries Research Station, Ocean Science campus and mangrove forest at Puthuvype, for the production of a film of the University and photography of the scholarship distribution to the outstanding MBA students executed by Manappuram group on 19/09/19.
- > Photography of Website launching ceremony of Aquabe- International Conference on Aquatic Resources and Blue economy 2019 (AQUABE-2019) on 19/09/19.
- > Photography of visit of dignitaries from Netherlands to discuss about documentary production on Visual Problem Appraisal (VPA) on 23/09/19.
- > NSS golden jubilee day celebrations and free eye testing camp organized by NSS unit of KUFOS on 25/09/19.
- > Photography of the seminar on “Recent advancement in molecular immunology research for sustainable aquaculture” conducted by Department of fish processing technology on 25/09/19, 26/09/19 and 27/09/19.
- > University main video film editing on 28/09/19, 29/09/19 and 30/09/19
- > Collection of plastic waste from Marine Drive Ernakulam organized as part of the Plastic Waste Free Campaign (Swachhata Hi Seva 2019) for creating public awareness on 16/10/19.
- > Orientation Programme conducted by Faculty of Fisheries for 2019 batch B.F.Sc students on 18/10/19 and 19/10/19.
- > Interview with Dr. Riji John, Dean Faculty of Fisheries for production of University Video film on 18/10/19.
- > Interview with Dr. A. Ramachandran, honorable Vice Chancellor, Dr. Dasy C Kappen Director of extension, Dr. T V. Shanker, Director of Research, KUFOS, Dr B Manoj Kumar, Registrar, KUFOS, Dr. Devika Pillai, HOD, Aquatic Animal Health Management and an ICAR student from Kashmir for production of University video film on 19/10/19.
- > Editing of University video film on 21/10/19, 22/10/19 and 23/10/19.
- > Photography of Peralspot seed distribution to Forest Department on 24/10/19.
- > Photography of two day regional workshop on “Genetics as applied to Aquaculture” conducted by Department of Aquaculture, Faculty of Fisheries on 24/10/19.
- > Video recording of different labs of the University for the production of University film

OCTOBER 2019

- > Photography of the plastic waste collection from Puthuvype beach and ship visit organized as part of 'Swachhata Hi Seva' a programme organized to commemorate the 150th birth anniversary of Mahatma Gandhi on 02/10/19.
- > Photography of the Seminar “Visual Problem Appraisal (VPA) on costal life of Kerala by the dignitaries from Netherlands on 03/10/19.
- > Guests visits at vice chancellor's office on 05/10/19.
- > Industry Advisory Board Meeting conducted by Department of Food Science and Technology, KUFOS on 11/10/19.
- > Seminar on 'Prospects and Challenges of Catering Industry in Kerala' jointly conducted by Association of Food Scientists and Technologists (India) Cochin chapter, All Kerala Caterers Association, Ernakulam District Committee and Kerala University of Fisheries and Ocean Studies on 15/10/19.

NOVEMBER 2019

- > Editing of University video film on 21/10/19, 22/10/19 and 23/10/19.
- > Photography of Capacity Building cum Distribution programme of “Aquaculture under Scheduled caste sub-plan” on 04/11/19.
- > Cage installation at Puthenvelikkara video shoot on 06/11/19 for the production of a film on “Cage aquaculture”.
- > Photography of University MoU signing at conference hall on 08/11/19.
- > Rough editing of the new shooted footage for University video on 12/11/19.
- > University Video editing with Director Public relations on 13/11/19.
- > Photography of western campus on 15/11/19 for including in the annual report.

- > University Video voice recording and editing with Director Public relations from 11 am to 4:30 pm on 16/11/19.
- > University Video editing with Director Public relations from 9:30 am to 4:30 pm on 17/11/19 (Sunday)
- > University video patch shoot of NCC parade practice and University computer cell from 10 am to 4:30 pm on 18/11/2019 and editing of the same from 4.30 pm to 1am on 19/11/2019 with Director Public relations
- > Some patch shoot of the University Chair buildings, Ladies hostel frontage, North east campus frontage, Western campus frontage etc on 19/11/19.
- > University Video editing with Director Public relations from 10:30 am to 8:00 pm on 20/11/19.
- > University Video editing completed on 21/11/19.
- > Shooting of the lab (Dept.of Fishery Resource Management) for the production of University Video and display of the same to before the honorable VC, DR and FO on 22/11/19 for making necessary modifications.
- > Photo Video coverage of the AQUABE 2019 Pre Conference workshop on VPA Kerala's cost 2.0 by Dr. Bert Enserink on 26/11/19.
- > University Video master out exporting on 27/11/19.
- > Video coverage of the AQUABE International conference from 28th to 30th November
- > Photos sorting and Editing of the important events at KUFOS during the year 2019 for the production of “Thiranottam 2019” on 30/12/19.
- > Editing and mastering of “Thiranottam 2019” on 31/12/19.

JANUARY 2020

- > Selected the photographs of AQUABE for sending to the Organizing secretary on 01/01/20.
- > Photography of two days workshop on “Entrepreneurship Development programme” conducted by CASRED on 16/01/20 and 17/01/20.
- > Selected photographs of University, classrooms, labs and other infrastructure facilities for sending to Dr. M. K Sajeevan for including in the KUFOS prospects on 24/01/20.
- > Selected photographs of AQUABE for sending to Director, Public Relations for publishing in the Challenger on 25/01/2020
- > Photography and Videography of Republic Day function and NCC parade on 26/01/20.
- > Video coverage of the field activities at Panagad on 29/01/19

FEBRUARY 2020

DECEMBER 2019

- > Photography of the signing of MoU between KUFOS and Aquaculture without Frontiers at V C's chamber on 03/12/19.
- > Photography of overseas training programme shrimp class sponsored by AKER Biomarine Ltd. (Norway) organized at KUFOS on 03/12/09.
- > Videography and Photography of KUFOS open day programme conducted at western campus on 03/12/19.
- > Photography of overseas training programme shrimp class sponsored by AKER Biomarine Ltd. (Norway) organized at KUFOS (Group Photo) on 06/12/19.
- > Photography of 4 days training programme on “Bakery Production” organized by CASRED at KUFOS on 10/12/19.
- > Videography of Vannamei Shrimp harvesting at western campus on 20/12/19.
- > Photography of the French Delegation Team lead by Mr. Serge Segura, Honorable Ambassador of the Ocean France and the All Indian Delegates on 05/02/20.
- > Photography of three days site survey along Anrakandy river Kannur on 12/02/20, Mahe and Valapattanam river on 13/02/20 and Kuppam river at Kannur and Valiyaparamba back waters that ends at Kasargod on 14/02/20 to carry out EIA studies sponsored by KITCO.
- > Photography of 'Radio Kissan Divas' jointly organized by All India Radio Kochi and KUFOS at Ochanthuruth, Bank Auditorium on 15/02/20.
- > Sorted photographs of the programme on 5/2/2020 and the programme from 12th to 14th February 2020
- > Selected the photographs of the open day on 3/12/2019 for preparing the Annual Report of the extension activities of the Directorate of Extension (2019-2020).
- > Photography of the one day training programme on “Hygienic Handling and Cleaning of Fish” organized under the plan project, Model Fish Processing plant and training on 28/02/20.

IV. Establishment of Fisheries Technical, Portal and Knowledge Centre

Fisherfolk engaged in fishing activities both in the inland sector as well as in the marine fisheries sector require timely information while carrying out their fishing operations. Similarly, innovations in the aquaculture including improvement in the existing practices have to be transferred in an effective manner to the fish farmers with the objective of increasing their per capita income, augmenting the fish production of the State, thus ensuring their livelihood security. Also, the dwindling catches in the marine sector indicate the necessity of creating awareness about responsible fisheries among the fisherfolk so as to avoid over-exploitation and the need to conserve the fishery resources for the future generation. Equally important is the post-harvest technology, as the fish is a highly perishable item, following hygienic handling practices throughout the various steps in fish processing is highly essential to ensure a better quality product both for domestic and export market which plays a major role in export earnings of the country.

In the above scenario, establishment of a Fisheries Technical Portal and Knowledge Centre at KUFOS will act as a single window in disseminating all the relevant information and technologies in the field of fisheries to the fisherfolk and fish farmers. It can be transferred to them through publications, conducting awareness and training programmes etc. The research findings, extension activities, academic programmes etc. of the University can be stored as digital files in the center for further use. It will also work as an audio-video library for the use of local people and students. In addition to these, the production of video films in the diversified sectors of fisheries viz. aquaculture and marine capture sector and distributing the same to the public and various institutions engaged in the development of fisheries sector through the centre will contribute to the dissemination of information at a faster rate leading to much progress in the fisheries sector. The Audio Video Recording Studio established at KUFOS has started the production of video films on the above mentioned sectors which can be disseminated among the farming community and fisherfolk through the Portal and Knowledge center established at KUFOS. The center can also provide information on various institutions/agencies working in the field of fisheries including their welfare activities. In addition to these, problems/constraints of the stakeholders in the field which require scientific interventions can also be conveyed back to the University for conducting research and offering solutions to them through this center

V. Farm Advisory Services

Lack of knowledge about the improved practices in aquaculture and allied sectors acts as an important constraint in the adoption of better management practices for increasing the fish production of the State. At the same time the technologies which are production-oriented should be promoted in an eco-friendly and sustainable manner. Creating awareness on freshwater and brackish water farming, mariculture, post-harvest technologies, responsible fisheries, need to conserve the fishery resources, judicious exploitation of the fishery wealth etc. plays a vital role in the total development of fisheries sector. Such information can be provided fruitfully to the farmers and fisherfolk by way of publications, conducting training cum demonstration programmes, showing video films, motivating them by distributing various inputs etc. As part of the above project to extend the technologies in the agricultural sector, KUFOS in association with AIR, Kochi and Ochanthuruth Service Co-operative bank has organized “Radio Kissan Divas” on February 15th 2020 at Bank Auditorium, Ochanthuruth.

Radio Kissan Divas

The AIR, Kochi with the co-operation of Central Agricultural Department is broadcasting “Kissanvani” a programme which deals with various knowledge related to agriculture, daily at 6.50 pm. As part of this, for the benefit of the farmers they are conducting “Kissan Divas” every year on February 15th. The organizers from AIR informed the University that this year they are celebrating the “Kissan Divas” by conducting one day agricultural workshop at Bank Auditorium, Ochanthuruth on 15/2/2020 and requested KUFOS to sponsor the programme. On discussion with the officials, AIR, the University decided to associate with the workshop and to co-sponsor it. The workshop on “Agriculture” started at

9.30am on 15/2/2020 with a formal inauguration. Sri.Balan, Programme Executive, AIR, Kochi FM welcomed the gathering. Smt. Leelamma Mathew, Station Director, AIR delivered keynote address. The seminar was inaugurated by the honorable Vice Chancellor, KUFOS Prof (Dr.) A Ramachandran and presided over by Sri.P.R Shaji, Station Engineer. Sri K.K Unnikrishnan, President, Elamkunnappuzha grama Panchayath and Sri. Albi Kalarikkal, President Ochanthuruth Service Co-operative Bank offered felicitations. Classes on “Possibilities of aquaculture in Kerala” by Dr. Daisy.C. Kappen, Director of Extension, KUFOS, “Jeevani, - Agriculture and our health” by T. Dileepkumar, Deputy Director, Principal Agriculture Office, Ernakulam, “NABARD schemes for Entrepreneurship Development” by Sri. Ashokkumar Nair AGM, NABARD, Ernakulam were arranged for the participants during the workshop. A programme “Mughamugham” was also organized in which “Jalamanushyan Kunjambu” an expert in the construction of trench and Smt. Lakshmipriya an entrepreneur who is farming 18 indigenous cows were honoured in this occasion. entertainment programmes, theatre sketches, dramas based on the literature of Sri. Rabeendranatha Tagore and Kunjunnimash by Thrissur drama group were also organized on that day.

Honourable Vice Chancellor, KUFOS inaugurating 'Radio Kissan Divas' at Bank Auditorium, Ochanthuruth on 15/2/2020



Dr.Daisy.C.Kappen engaging a session on 'Possibilities of Aquaculture in Kerala'



VI. Exhibition Unit

Conducting/ participating in exhibitions organized by different institutions is an important means of the transfer of technology. Participation of people in such events and exposure to various technologies will help in developing interest and motivate them in adopting the new technology at a faster rate.

During the year 2019-20 Kerala University of Fisheries and Ocean Studies has organized an International Exhibition “AQUABE 2019” from 28th to 30th November 2019 and participated in three international exhibitions organized by different institutions.

1.ASIAN PACEFIC AQUACULTURE-2019

World Aquaculture society-Asian Pacific Chapter in association with Tamilnadu Dr. J. Jayalalitha Fisheries University was organized an International Conference Asian Pacific Aquaculture (APA2019) at Chennai Trade Centre, Tamilnadu, India during 19-21 June 2019. The programme also hosted a trade show for the event with over 230 booths representing Indian and international companies. As per the request of Dr.S. Felix, Vice Chancellor, TNJFU & President, WAS -Asian Pacific Chapter, National Co-Chair-APA'19, KUFOS has participated in the tradeshow organized along with the event. The programme started at 9.30am on 19/6/2019. Hon'ble Governor of Tamilnadu Thiru. Banwarilal Purohit, Chancellor, Dr.J .Jayalalitha Fisheries University presided and inaugurated the conference & trade show and delivered chief guest address. The Hon'ble Minister for Fisheries and Personal & Administrative reforms Thiru. D Jayakumar, Pro-

Chancellor, Tamilnadu. Dr. J. Jayalalitha Fisheries University was the guest of honor. Dr. K Gopal, IAS, Principal Secretary to Govt, Animal Husbandry, Dairying and Fisheries Department and Dr. J K Jena, Deputy Director General of Fisheries, ICAR delivered the felicitation address. The trade show was organized every day from 10am to 6pm. A stall of size 3m x 3m was allotted to KUFOS and it was arranged in a befitting manner. Brochures and leaflets depicting the activities and achievements of KUFOS in the field of teaching research and extension were distributed to the delegates and dignitaries from various countries. In addition to these a video film of the same was also displayed in the stall.

Prof. (Dr.) A Ramachandran, honorable Vice Chancellor, KUFOS and Dr. J K Jena, Deputy Director General of Fisheries, ICAR visiting KUFOS stall



ii. AQUAAQUARIA-2019

AQUAAQUARIA 2019 was an international conference held at HITEX exhibition center Hyderabad, from 30th August to 1st September 2019. The event was organized by Marine Products Export Development Authority (MPEDA). Aquaculture famers conclave, Aquaculture startup meeting, Submission of abstracts, Paper presentations, Poster Presentations, exhibition etc were arranged as part of the conference. Technical Sessions on Sustainable production and diversification, Significance of Aquaculture in seafood export from India, Sustainable aquaculture in an era of diversification: Successful examples from Asia, Production of Tilapia as a sustainable and diversified crop to India's Aquaculture community, Using conventional and novel methods to enhance Mangrove crab (*Scylla spp*) production, etc were also carried out during these days. The function was inaugurated by Shri. M Venkaiah Naidu, Hon'ble Vice President of India. Shri T Srinivasayadav, Hon'ble Minister for Animal Husbandry and Fisheries, Govt of Telungana and Shri Mopidevi Venkata Ramana, Hon'ble Minister for Animal Husbandry and Fisheries Marketing, Govt of Andhra Pradesh were the chief guest of honour of the day.

Delegates from Hawassa University, Ethiopia and Prof. (Dr.) A Ramachandran, honorable Vice Chancellor, KUFOS at KUFOS stall



Kerala University of Fisheries and Ocean Studies (KUFOS) has participated and put up a stall in the exhibition. A stall of size 3m x 3m were allotted to KUFOS. A video film showing the activities and achievements

of the University in teaching, research and extension were displayed in the stall. In addition to these brochures and leaflets of the same were also distributed to the delegates. The exhibition was scheduled from 10am to 6pm. About 4,000 participants including 3000 aqua farmers representing all the coastal states participated in the event.

iii .AQUABE- 2019

In order to understand and highlight the contributions of aquatic resources, both living and non-living to blue economy, Kerala University of Fisheries and Ocean Studies (KUFOS) in association with leading National Organizations organized a three days International Conference on Aquatic Resources & Blue Economy (AQUABE 2019) at Le Meridien Kochi, from 28th November to 30th November 2019. As part of the conference, aquaculture famers conclave, paper presentations, poster presentations, exhibitions, technical sessions on Aquatic Resource Management - Living, Aquatic Resource Management – Non-living, Aquatic production systems, Climate Change Impacts on blue economy, Ocean Health and Global Warming, Ocean Process and Environmental Assessment, Aquatic Products and Technologies, Marketing and Trade, Legal regimes, policies and Governance, Education and Capacity Building were also arranged. The function was inaugurated by Smt. J Mercykuttyamma, Hon.Minister for Fisheries, Harbour Engineering and Cashew Industries, Government of Kerala and Pro Chancellor, KUFOS and presided over by Dr. A Ramachandran, Hon Vice Chancellor, KUFOS. H E Ambassador Dr. Nomvuyo Nokwe, Secretary General, Indian Ocean Rim Association was the Chief Guest of the day. The Guest of honour viz. Mr. K S Srinivas IAS, Chairman, Marine Products Export Development Authority (MPEDA), Mr. Vikram K Duraiswamy IFS, Joint Secretary, Ministry of External Affairs, Government of India, Mr. Madhu S Nair, Chairman and Managing Director, Cochin Shipyard, and Dr. S C Shenoi, Director, Indian National Centre for Ocean Information Services addressed the participants.

Glimpses of the KUFOS stall organized at Le Meridien



Along with the Conference an exhibition was also arranged. Altogether 35 institutions both from private and public sector participated in the exhibition. KUFOS had put up a pavilion of 9m x 3m in a befitting manner. Five Aquarium tanks of different sizes were set in the stall. Fishes like Gold fish, Angel fish, pearlspot, neon tetra, indigenous fishes etc. were kept in the aquariums. Aquarium plants viz. Anubias gracilis vesicularia, microsorium, utricularia rothalia, cobamba, vallisnaria, amason sword plant etc, were used for setting up of two planted aquarium tanks in the stall. In addition to this models of different crafts and gears, cage culture, samples of food products, posters etc were also kept in the stall. A video film showing

the activities of the University was also displayed during these days. The exhibition was scheduled from 9am to 5pm. Brochures and leaflets showing the activities and achievements of KUFOS in the field of teaching, research, extension and technologies developed and standardized at KUFOS were also distributed to the delegates and public as part of the transfer of technology process. Interpreters trained in the concerned field were engaged in stall duty and explained everything in detail to the visitors. Five hundred and seventy participants including 150 aqua farmers representing all the coastal states visited the exhibition stalls.

iv. INDIA INTERNATIONAL SEAFOOD SHOW 2020 REPORT

India's Seafood Industry is one of the leading suppliers of quality seafood to all the major markets of the world. India also has a large no of seafood processing units adopting the state of the art technology in seafood processing. This makes India the most attractive market for machinery manufacturers, suppliers and certification bodies

IISS 2020 offered a platform for all stakeholders to meet, deliberate on various aspects of the seafood industry for striking business deals and to have an update on the latest developments in the field. The event was organized by the Seafood Exporters Association of India (SEAI) in association with Marine Products Export Development Authority(MPEDA) Kochi from 7th February to 9th February 2020 in Lulu Convention Centre at Kochi. It had more than 250 stalls to showcase various pre-processing, processing and storage technologies in the seafood industry and also acted as an ideal platform for one to one interaction with seafood importers and exporters.

Technical Sessions on Prospective Markets & Regulatory Environment, Certification, Traceability & Value Addition , Tuna export value chain- Better harvest practices, etc were also carried out. The function was inaugurated by Arif Mohammad Khan Governor of Kerala. Among others who addressed the inaugural function were K.S. Srinivas, Chairman of MPEDA, and his predecessors Leena Nair, and G. Mohan Kumar, Dr. Christy Fernandez, Chairman of Kerala State Industrial Development Corporation (KSIDC) and Jagdish V Fofandi National President of SEAI.

Smt. J Mercykuttyamma, Hon.Minister for Fisheries, Harbour Engineering and Cashew Industries, Government of Kerala and other dignitaries visiting KUFOS stall



Kerala University of Fisheries and Ocean Studies(KUFOS) participated in the exhibition. A stall of size 3mx3m was allotted to KUFOS. The achievements of the University were displayed in the stall. The exhibition was scheduled from 10 am to 6 pm. Brochures and leaflets showing the activities and achievements of KUFOS in the field of teaching, research, and extension were distributed to the public. Experts from KUFOS explained everything in detail to the public. The total participation of the programme was about 5000 participants including aqua farmers and students representing all the States

V. THE CELEBRATION OF AGRICULTURAL EDUCATION DAY ON 3rd DECEMBER 2019

As per the direction of the Indian Council of Agricultural Research an “Agricultural Education Day” was conducted at Kerala University of Fisheries and Ocean Studies on December 3rd- 2019 by organizing an “Open Day” to commemorate the birth day of the first Indian Union Agriculture Minister and the first President of Independent India, Bharat Ratna, Dr. Rajendra Prasad. The University is organizing such programme every year to fulfill the aims of ICAR i.e. to develop interest among the school and college students in agriculture and allied sciences and also to choose 'agriculture' as their professional & research career/engage themselves in farming as agri-entrepreneurs. The programme was organized from 9 am to 5 pm. Faculty from KUFOS conducted demonstrations and exhibitions for the visitors in different aquaculture techniques like aquaponics, GIFT Tilapia culture and cage culture. A total of 320 visitors including students and teachers from various colleges and schools and public visited the University. The day provided an opportunity to know the facilities available in the University such as Aquarium, Aquaculture Lab, Biodiversity Museum, Fish Farm, Aquaculture Lab, Fish Processing Lab, Fishing craft and Gear Technology lab, Hatchery and Library. Various fishery byproducts and value-added products were also displayed. Details of various aspects of aquaculture and fisheries were explained to the farmers and students. For the smooth conduct of the programme, 15 Naval NCC students were deputed as volunteers for doing the duty and refreshments were provided to the staff and students engaged in the duty.

Glimpses of the Open Day organized on 03/12/2019 as part of the celebration of Agricultural Education Day



Glimpses of the Open Day organized on 03/12/2019 as part of the celebration of Agricultural Education Day



VII. Centre for Field Consultancy and Data Analysis

Taking into account the need for creating a single window system for providing fisheries sector data and the growing demand for consultancy for data analysis in fisheries and allied sector, the School of Management and Entrepreneurship, KUFOS launched a Centre For Field "Consultancy and Data Analysis" during the XII Plan period. The center aims to document, analyze and publish data both from primary and secondary sources relating to fisheries and allied sectors. Providing consultancy service on data analysis and interpretation is also envisioned.

The major objectives are

- To collect world and region-wise fisheries sector data relating to resources, production, fisheries trade, etc.
- Collect data on total fish production in India and Kerala, species - wise and category wise and its documentation.
- Collect data relating to marine products export, fishery resources, fisherfolk, etc., of Kerala and India and its documentation.
- Undertake data analysis for industry, researchers, and other agencies on demand.
- Impart training and development services on demand.
- Take up consultancy services in Project preparation and evaluation.
- To suggest policy measures based on the findings of the study

As part of the project, quarter - wise and species - wise marine fish landings of maritime States of India from the period 1975-2000 was collected, sorted and documented. Collection of data relating to global fish production from 1950 to 2013 includes collection, analysis and documentation of data relating to capture production, culture production and seaweed production

VIII. Setting up of Cage culture units for production and training in two geographical zones of Kerala for further demonstration and popularization of the technology.

The programme is being operated under the Plan Project of Kerala University of Fisheries Ocean Studies (KUFOS) funded exclusively by Government of Kerala. The project was started in January 2019. The major objective of the project is to train interested beneficiaries in two geographical zones of Kerala (Kannur and Kollam Districts) and establish cage culture units for further demonstration and popularization of the technology which was successfully demonstrated by the Directorate of Extension, KUFOS elsewhere. The lead researcher of the programme is Dr. K. Dinesh, Associate Professor and Head, Department of Aquaculture and the Co Investigators are Dr. Daisy C Kappen, Professor and Director of Extension i/c, KUFOS, Dr. B. Manoj Kumar, Registrar i/c and Special Officer of Kannur Regional Centre, and Mr. Prasannan, Special Officer of Kollam Regional Centre of KUFOS. The supporting personnel include one Senior Research Fellow (SRF), Miss. Keerthana T.A. and two Field Assistants, Mr. Al Ameen and Mrs. Chinju Lal. The SRF joined the office on 01.01.2019 and two Field Assistants on 29.12.2018 & 30.12.2018 respectively. Keerthana T.A. (SRF) and Al Ameen N. (Field Assistant) were directed to attend the duty in Regional Centre of KUFOS in Payyanur, Kannur and Chinju Lal (Field Assistant) was directed to work in Kollam.

In the first few months, the team surveyed and followed the pilot projects operated by the farmers for better understanding of the existing practices of cage culture along various places of Kannur and Kollam towards suggesting improvisation. It is fact that the culture of aquatic organisms in cages is getting popular in these regions, but farmers are not fully aware of the scientific principles of this technology. In order to create better awareness among the farmers on the scientific methods and recent developments in the field of cage aquaculture, KUFOS conducted a One Day Seminar on 01.03.2019 with the participation of 97 farmers.

Department of Fisheries, Government of Kerala, Central Marine Fisheries Research Institute (CMFRI) and Aquaculture Development Cooperative Society (ADCOS) also collaborated with the programme. The Seminar was inaugurated by the hon.MLA of Payyanur Sri C. Krishnan. Dr. B. Manojkumar (Special Officer, Kannur Centre, KUFOS), Dr. K. Dinesh (Associate Professor and Head, Department of Aquaculture), KUFOS, Shri. Purushothaman T. (Chairman, ADCOS), Smt. K. Vanaja (Senate Member, KUFOS) were also present during the occasion. Dr. K. Dinesh gave an overview of the project clearly explaining the objectives and the responsibilities of the beneficiaries. Dr. A. P. Dinesh Babu, Principal Scientist, Mangalore Research Centre of CMFRI discussed the techniques involved in brackish water cage culture operations emphasizing the culture of Asian sea bass. Dr. Bobby Ignatius, Principal Scientist, CMFRI, Cochin explained the principles of cage farming and importance of better management of the cages. He discussed the enormous potential of open sea cage farming in suitable areas. Shri. Rijul Raj from the State Department of Fisheries gave an account on the various schemes of the Fisheries Department for encouraging fish culture. The meeting elaborately discussed various aspects of the fisheries and aquaculture pertaining to Malabar region and provided suggestions to the participants to plan their livelihood better through cage culture programmes.

Glimpses of the One Day Seminar on Cage culture on 01.03.2019 at Payyanur



As the second step, KUFOS had conducted a One Day Awareness programme on cage culture at Mandrothuruth, Kollam on 13th June 2019. A total of 85 participants attended the event. It was inaugurated by Mr. Binu Karunakaran (Mandrothuruthu Grama Panjayath President). Prof. (Dr.) Riji John, Dean Fisheries, KUFOS presided over the function. The project was introduced by Dr. K. Dinesh K., the Principal Investigator. The classes were handled by Dr. G. Gopakumar (Former Head, Mariculture Division, CMFRI). The last part of the programme was a productive session by Dr. Sophia Margaret Joseph (Assistant Director, Department of Fisheries, Govt of Kerala) on various schemes implemented by the State Fisheries Department for fish farmers.

Glimpses of the One Day Awareness programme in Mandrothuruthu on Cage culture on 13.06.2019



The project team continued the gathering of information on various cage culture programmes operated by Department of Fisheries by visiting various places in Kannur. Such surveys also helped to find out the suitable areas for the implementation of the KUFOS project. The team extensively collected the information on the background of the beneficiaries, prevailing practices, problems faced by the farmers, issues of rearing fishes, health related problems etc. by regularly visiting the farming community from the regions of Valiyaparamba, Thekkekad, Vadakkekad etc. with the support of KUFOS Regional Centre Kannur, Payyanur. The SRF and Field Assistant also participated in the various activities organized by KUFOS Regional Centre such as the collection of hydrobiology parameters of Kavvayi backwaters, collection and estimation of fish catch data, gathering mussel culture data and helped in setting up of the Molecular Disease Diagnostic laboratory and hydrobiology laboratory. Water quality parameters of Kavvayi backwaters of Payyanur were assessed by using Bio photometer towards finding out the ideal locations for the programme. The preliminary study revealed that the water body is much alike across all the sampling locations.

Similar activities were carried out in Kollam also in association with Kollam Regional Centre of KUFOS. The Field Assistant visited various cage culture-sites to gather the prevailing information especially the various locations along Mandrothuruth. Such surveys helped to have a better idea of the suitable areas useful for installing cages. She also collected the required inputs and information from FFDA towards the implementation of the project. The information collected from various locations were discussed with the Principal Investigator in person for the every now and then.

Most unfortunately, the implementation of the project faced unforeseen delay due to the lack of funds for procuring cages, seed and feed which is the most important part of the project. Though the selection of farmers was completed much earlier in Kannur and Kollam with the support of the respective Centers, the distribution of cages got delayed due to lack of funds. In Payyanur, ADCOS also helped to find out the deserving beneficiaries. In Kollam, the group of farmers were selected with the help and support of Mandrothuruth Panchayath. About 23 beneficiaries were short listed as the beneficiary candidates of the project on the basis of their willingness and experience in cage culture.

Due to the lack of funds and delay in cage distribution coupled with bad weather conditions in certain seasons, the project lost its pace at many phases. Though the original proposal of the project was for a total of Rs. 40 lakhs, the allotment from the Government remained very low and sometimes was sufficient only to meet the remuneration of the project staff. The process of procuring the cages got interrupted at many points. On repeated requests, University has permitted to procure only 50% of the proposed cages and with that decision, the project regained its pace to some extent. It was decided to procure 6 cage units each (one unit will have 3 individual cages) in Payyanur and Kollam. The cages were supplied by Aquaculture Development Cooperative Society (ADCOS), Payyanur through the bidding process. Though the ADCOS supplied the items almost 6 months back, the payment is yet to be released by the University.

In between a discussion session with the beneficiaries was held on 21st January 2020 at Payyanur in the presence of Dr. Dinesh K. and T. Purushothaman (Chairman, ADCOS). The project was explained and their comments were gathered. The same sort of discussion was also held at Mandrothuruth in Kollam in which the Grama Panchayath President, Mandrothuruthu offered his wholehearted support. As a result of these discussions, 18 beneficiaries from Kannur and 18 beneficiaries from Kollam were finally selected.

Beneficiaries meeting of cage culture project conducted at PAYYANUR on 21.01.2020

From the second week of December onwards, the installation of cages was started at Payyanur. The materials were procured by ADCOS and the work was completed in February 2020. The cage installation of Kollam was completed simultaneously. Steps are being taken to purchase the seeds and feed required for these units.



Construction of cages in Payyanur



Cage construction at Kollam



IX. Maintenance of Museum/Aquarium –

The AGK Menon Memorial Museum of Aquatic Animals established at KUFOS during the year 2016 houses a rich collection of finfish and shellfish specimens from marine and inland waters of India which are on display and attracting school and college students, researchers and the general public. The main objective is to impart education and awareness among them about aquatic bio diversity and to build up their competence and confidence

The ornamental fish culture and aquarium keeping have assumed considerable significance as an international hobby and all these have been proved to be lucrative in the global trade scenario. Though the ornamental fish trade with a turnover of US \$ 8 billion and an annual growth rate of 8 percent offers lot of scope for development, India's share in ornamental fish trade is estimated to be less than 1% of the global trade and the major part of the export trade is based on wild collection. Taking into account this, KUFOS focused on popularizing and developing entrepreneurship in ornamental fish culture and conducting training cum demonstration programmes on ornamental fish culture with a view to enabling them in starting small - scale units. The public aquarium at KUFOS named after the visionary, former Hon'ble Vice Chancellor of Kerala Agricultural University, Dr. A.M Michel is an exhibition-cum-education center on ornamental fishes. It was opened to the public at a function held on 4th April, 2013 by Shri. K. Babu, Hon'ble Minister for Fisheries, Ports and Excise, Govt. of Kerala to mark the second anniversary of KUFOS. The complex consists of two wings with a total of 46 tanks of assorted sizes-20 each of the size 4'x2'x2.5', four of the size 7'x2'x2' and two plasma tanks. The entrance has a central Koi pond stocked with a variety of koi fish and two beautiful artificial waterfalls. Nearly 1500 fish of different aquatic environment comprising well over 25 species of indigenous and exotic freshwater fishes, such as loach, Miss Kerala, barb, gold fish freshwater shark, angel fish tetras, guppy, platy molly, swordtail, arowana, pacu, yellow sun catfish, eel, severum, dollar fish, different varieties of cichlids, gouramies, parrot fish, oscar devil fish, giant freshwater prawn, brackish water fishes viz. Mullet, milk fish, pearlspot and marine fish like damsel, clownfish, sea anemone, tentacle anemone, butterfly fish, banner fish surgeon fish etc. are on display in combination with several indigenous and exotic aquatic plants set in different styles. In order to make the project self-sustainable, a nominal entry fee of Rs.20/- for adults, Rs.10/- for children of the age 5-15 years and Rs.5/- for students (visiting in groups of not less than ten) is being charged. The fishes kept in the Public Aquarium in addition to providing entertainment to those visiting, also motivate the people to start small scale units. Along with the public aquarium, models of different crafts, gears and photographs showing the activities and achievements of KUFOS in teaching, research and extension are also displayed in a separate building which attracts students, public and officers from different institutions. Altogether, 994 public and 1018 students visited the Public Aquarium and Museum and created a revenue of Rs. 30060/- (Thirty thousand and sixty only) during the year 2019-20.

Students visiting the Public Aquarium



In addition to these, 723 students from KUFOS also visited the museum and aquarium to enrich their research and academic activities. Dr. Binu Varghese, Dept. of Aquaculture, Dr. Anwar Ali, Dept. of Fisheries Resource Management, Dr. Pramila, Dept. of Fisheries Resource Management, Dr. Prabhakaran, Department of Aquatic Environment Management, Dr. Jayalakshmi, Dept. of Fisheries Resource Management and Dr. K. Renjith, Department of Aquatic Environment Management and Dr. Rajeev Raghavan, Dept. of Fisheries Resource Management conducted their practical classes for the graduate students by making use of these facilities.

X. Development of Instructional Farm –

Aquaculture is a field-oriented subject, necessitating adequate field training facility for imparting hands-on training to the students. The students need to be familiarized with all aspects of aquaculture both in the field of freshwater as well as brackish fish farming. Moreover, as it is highly risk-oriented, imparting skill in carrying out different activities viz. preparation of field, determination of physical and chemical water quality parameters, acclimatization, stocking, feeding, quarantining etc. is highly essential for the students to make them confident in starting and running a farm independently and profitably. This requires an urgent need for upgrading the existing facility at KUFOS to impart quality training needed to equip the students more effectively. It is also essential for popularizing fish culture among the farming community and conducting training cum demonstration programmes to the fish farmers. The University has enough ponds in the campus and over the last few years modernization of the instructional field training facility is in operation by utilizing the Plan fund allocation.

Instructional farms in the Western campus



XI. Farmers Training Centre

Imparting training to the fisherfolk and fish farmers is an important means for increasing the level of knowledge and rate of adoption of better management practices which, in turn, will help to augment fish production of the State, increasing the income of the farmers, creating more employment opportunities to them and improving the quality of the product for export etc. If such training programmes are residential in nature, it would result in the efficient utilization of more time in a day. As part of the transfer of technology process, KUFOS is conducting various training programmes on aquaculture, harvest and post-harvest technologies under the various extension plan projects. Farmers from all over the State of Kerala are attending these programmes. While organizing these training programmes providing accommodation in the University campus acts as a major constraint which could be overcome by establishing a Farmers Training Centre having all facilities. University has taken necessary steps for the construction of a Farmer's Training Centre.

XII. Model fish processing plant and training center

Though the fisheries sector provides immense employment opportunities in the State of Kerala, very low shelf life of the fish acts as a major constraint in marketing the diversified fishery products both in the domestic and export market. The fishes can be stored only for a few hours after it reaches the ground. Thus, knowledge on the shelf life and ways to preserve it are very important and essential to transfer the same to the target group. Any developed technology becomes meaningful as and when it reaches the common and needy people. The project aims to provide better solutions to the above problems by making the fisherfolk aware of the ways of preservation of fish and preparation of various value-added fishery products under hygienic conditions. Such an approach will help in creating more employment opportunities to the fisherfolk and fish farmers including the womenfolk and lower sections of the society, thus leading to women empowerment and uplifting the society particularly along the coastal areas. Equipment for imparting quality training on various aspects of post-harvest technologies were purchased and facilities established under this project is utilizing for imparting quality training to the fisherfolk including the women and students on various aspects viz. techniques of preservation, preparation of value added products, handling of processing and laboratory equipment, quality evaluation methods, sanitation and marketing practices etc. Under this project the following training programmes were organized in association with the CASRED by making use of the available facilities at the model fish processing plant

1. Training programme on “Skill Development Programme on Value Added Fish products” on 30th and 31st August 2019):

As part of the plan project “Model Fish Processing Plant and Training Centre” a two day training program “Skill development programme on Value added fish products” was conducted on 30th and 31st August, 2019 at Department of Fish Processing Technology in association with the CASRED. The training programme was started with a formal inauguration at KUFOS seminar hall by Dr. T.V. Shankar, Director of Research, KUFOS, presided over by Dr. L.Suresh Mallya, Professor Chair, CASRED (Centre for Advanced Studies and Research in Entrepreneurship Development) in the presence of Dr. Daisy C Kappen, Director of Extension, Dr. Radhika Rajasree S R, Head of the Department and Dr. Abhilash Sasidharan, P I of the project followed by a lecture





session on value addition of seafood by Dr. Abhilash Sasidharan. About 19 participants from different places of Kerala attended the programme. The classes were scheduled from 9.30 am to 4.30pm. Dr. Abhilash Sasidharan, Principle Investigator and Miss Vishnupriya, Research Fellow of the project engaged classes to the trainees and conducted practical sessions with the support of the Research Scholars working in the Department. Hands on training was given to the participants for the preparation of fish pickle, battered and breaded products like fish ball, fish cutlet, fish finger, fish burger, butterfly shrimp, fish fillet, steak. The programme came to an end at 5.00pm on 31st August 2019.

II. Training programme on “Hygienic cutting and Handling of Fresh fish” on 28th February 2020

As part of the plan project Model Fish Processing Plant and Training Centre One day training program “Hygienic Cutting and Handling of Fresh Fish” was conducted on 28th February 2020 at Department of Fish Processing Technology. The training programme was started by a formal inauguration at KUFOS seminar hall by Dr. T.V. Shankar (Director of Research, KUFOS in the presence of Dr. Daisy C Kappen (Director of Extension/c), Dr. Radhika Rajasree S R (Head of the Department) and Dr. Abhilash Sasidharan (P.I. of the Project) followed by a lecture session by the PI of the project. About 16 members from different places of Kerala participated in the programme. The training programme started at 9.30 am. The classes were handled by a resource person from Matha Fresh Fish Store, Chambakkara, Kochi, Dr. Abhilash Sasidharan, PI, Miss Vishnupriya, Research Fellow and other Research Scholars of the Department. Hands on training were given for professional cutting and handling of fishes. The programme came to an end by 5.00pm on 28th February 2020.

Hands on Training



XIII. The Pandit Karuppan Chair for Policy Studies on livelihood security and Socio – Economic Empowerment of Fisherfolk

The programme Pandit Karuppan Chair for Policy Studies on Livelihood security and Socio-economic Empowerment of Fisher folk is being operated under the Plan Project of Kerala University of Fisheries and Ocean Studies (KUFOS) funded exclusively by Government of Kerala. The project was originally started in 2013. The major objective of the project is to assess the socio-economic Status of the fisher folk, and to explore the livelihood security of the fisher folk since its inception. The current Principal Investigator of the programme is Dr. M.S.Raju, Professor & Director, School of Management and Entrepreneurship. The supporting personnel include one Project Scientist (Mr. Ambrose. T.V) and one Technical Assistant (Mr.Sreenath. K). The Project Scientist joined the office on 6th January 2018 and the

Technical Assistant on 10th December 2019. The Project Scientist Mr. Ambrose TV was relieved from the duty w.e.f. 5th January 2019 to complete his PhD thesis.

Tabulation and data analysis on the Socio-Economic Status for the year 2018-19 was completed. Report on the Socio-Economic Status for the year 2018-19, the final report is ready for printing. Field level survey for the year 2019-20 was done based on a modified questionnaire. As part of data and literature collection, the project staff visited MPEDA and CMFRI. Field survey was carried out for collecting data from different national & state institutes. A pre tested interview schedule was developed for collecting the primary data.

A brief review of the work carried out during 2019-20

Villages from each stratum were selected at random and the households in the selected villages were chosen by adopting snowball sampling technique. Thus, out of the 222 marine fishing villages 7 districts were selected and 1290 households were surveyed. The field survey was conducted during April 2018- March 2019. Field work is conducted in 1290 households from 42 fishing villages from the following Districts: *Alappuzha district*: - Omanappuzha (30HHs) Pollathai (30), Thaneermukkam (27), Alappuzha beach (30), Thumpoli (30), Muhamma (30), Punnapra (30), Ottamassery (30), Arthungal (30), Pallana (30), Cherthala (30), Purakkad (30), Aroor (30), Pathiyankkara (30). *Trivandram Dist*: -Poovar (30), Adimalathura (30), Vizhinjam (30), Pullvilla (30). *Kottayam Dist*: - Kozhikattu (31), Pollasserri (30). *Kollam dist*:-Parayakadavu (30HHs), Eravipuram (30), Thankkassery (30), Neendakkara (30), Alappad (30), Mayyanaduthanni (32), Azheekal (30), Mukkad (30). *Thrissur Dist*: - Valappad (30), Blangad (30), Chavakkad (30), Perinjanam (30), Koolimuttam (30), Vadanapilly (30), Azhhekode (30), Edavilangu (30), Nattika (30). *Malappuram Dist*:-Tannur (30), Kadalundi (30), Koramankadappuram (30), Purathur (30HHs). *Calicut Dist*: - Chriyamankkad (30), Kuriyadi (30).

Major Findings, Suggestions and Conclusion

The profile of the fisher folk households showed that 62.64 % were from BPL families and 37.36% were APL families. The profile the fisher folk indicated that, 75.50% of the fisher folk belongs to OBC group while only 24.50% of fisher folk belongs to Scheduled caste and Scheduled Tribe. Analysis of age wise distribution of population data indicated that, majority of the fisher folk belonged to the age group between (16-30 & 31-60) age group, 13.80% were above 60 years, 14.76% falls under the age group of 16 years. The profile indicated that the population of the 1290 households was 5351. The males constituted 53.37% of the population and females constituted 46.63%. The sex ratio was estimated to be 0.87. The sex ratio is defined as the number of Female per 1000 males. Out of 1290 households, 91.01 % are from nuclear family rest 8.99% are joint family.



The details about the level of education attained by the fisher folk population are also analyzed. It was found that majority of them were educated only up to primary levels i.e. (48.89%), followed by secondary (37.42%), graduates (10.50%), professionals (1.30%) and illiterates (0.81%). The religion wise categorization showed that out of 1290 households, 48.99% were Hindu, 27.44% were Christians and the remaining 23.57% were Muslims. The housing pattern showed that the majority of the fisher folks dwell in thatched houses (38.47%) against 29.88% in tiled, 18.24% in hut houses and the rest 13.41% in concrete houses. Analysis shows that 41.52% of the households possess house with tile flooring, 24.42% had mud flooring and 16.67% lived in cement flooring houses. The study revealed that among the 1290 households majority of them are electrified i.e. 78% and 21.63% were not. The study found that 73.84% of the households have sanitation facilities like latrines and in 26.16% cases it was absent.

The details relating to the ownership was analyzed as part the study. Results showed that 83.26 percent of them possessed own land and 16.74 percent had no landed property. In the state as a whole, majority of the households, i.e., 40.16% had landed property below five cents while 34.81% had land below 10 cents, 21.47% of them possessed land below 20 cents. 3.57% possessed above 50 cents. The information regarding occupational profile shows that fishing is the main vocation to 45.34% of households; which is followed by fish vending (2.08%), peeling (1.98%) and private jobs (23.23%). Very few people were going to *Thozhilurappu*, fish drying and other jobs. 24.40% were students and 2.10% were pensioners.



In 1290 households, 99.46% were traditional fisherman and 0.50% were from acquired Fisherman category. The details about the income status of fishermen families revealed that majority of them (51.86%) earned income in the range of above Rs.10000/month, 29.84% of them had income class in the range between Rs.5001-10000, 15.35% were included in the range of Rs. 1501-10000/-. The per capita income of fisher folk was found to be Rs.2232/- The study revealed that out of the 1290 HHs, 40.78% were indebted and other 59.22% houses are not. The study found that the HHs were highly

indebted. In the state wise analysis most of the fisher folk registered their name with various fisheries agencies. Majority of the fisher folk registered with Fisherman co-operative society (65.31%) and fishermen welfare fund board (34.69%). In the State as a whole, the most common consumer durable in the HHs was television (36.33%). About 32.12 % owned furniture. A few of them (1.34 %) had ownership of computer. 5.45 % had radio. The usage of computer by fisher folk is less when compared with other appliances. 17.23 % fisher folk households subscribed newspaper and 7.51% had fridge.

Government provides grants for buying fishing implements, land purchasing and house repairing. This study shows that mainly grant was provided for education and housing. For fishing implements total value provided was Rs.359697/-. From the surveyed districts total value provided for education was Rs 588029/-. From the 1290 households surveyed, 8.14 % youngsters are interested in fishing. Most number of persons engaged in fishing were from Calicut and Malappuram (25%), and lowest were from Kollam (4.13 %). 74.73 % respondents marketed the fishes directly and 25.27 % depended on intermediate parties for marketing. Fish famine, pollution and reclamation are the major problems affecting fishing. From this survey it is revealed that fish famine was the major problem affecting fishing i.e. (56.81%). Pollution was the second most affecting factor (19.54%) and another problem was reclamation. Reclamation was the major problem affecting the inland sector (23.56 %).



Among 1290 households, average expenditure of rice and wheat was found to be Rs. 7201.44/-. The average expenditure of fish was found to be Rs. 5815.71/- . The average expenditure of meat was Rs. 6123.89/ and tuber was Rs.2539.85/-. Out of 1290 houses examined the average amount spent for clothes at the time of survey was Rs. 3574.49 /-. An average expenditure of Rs. 6986.88/- was spend on education .The average expenditure on housing was Rs.1737.45 /- .

Most of the infrastructure facilities like school, potable water, landing center, cold storage, telephone booth, roads, banks etc. are within the radius of 3 to 9 km range in most of the districts. Certain facilities like accessibility to Fisheries Department, Colleges, police station are not in

convenient places. It can be concluded that there should be more infrastructure facilities like landing centers with high-tech facilities, ice plants, marketing centers nearby fishing villages to encourage fisher-folks to create better environment for their fishing activities.

Other Activities of the Centre

- One day training programmes was conducted for BFSc students under the University on “the methods of collecting Socio-economic data of fisheries in Kerala.
- Participated in a workshop on “Econometrics and Data Analysis” conducted by the St. Peters' College Kolencherry on 21-23rd November 2019.
- Participated and presented an Article on AQUABE 2019 conducted by KUFOS which was held at Le meridian on 28-30 November 2019.
- Data entry of socio economic data for the year 2019-20 is continuing.

XIV. Massive open online courses

For India to emerge as a knowledge super power of the world in the shortest possible time it is imperative to convert our demographic advantage into knowledge powerhouse by nurturing and honing our working population into knowledge or knowledge enabled working population. With an ever expanding field of knowledge, the knowledge and skill sets required by an individual to successfully lead life has also expanded, throwing up challenges of learning more and more throughout one's life. Add to that challenges of pedagogy being faced by the teachers to package more and more for the uptake by the students within the same amount of time available. Fortunately, the ICT as a tool in education is available to us at this juncture. A massive open online course (MOOC) is an online course aimed at large-scale interactive participation and open access via the web. In addition to traditional course materials such as videos, readings, and problem sets, MOOCs provide interactive user forums that help build a community for the students, professors, and teaching assistants (Tas).

MOOCs are a recent and widely researched development in distance education which was first introduced in 2008 and emerged as a popular mode of learning in 2012. Most world renowned Universities are offering MOOC programmes the leading being MIT currently with 2282 online courses. In India, IITs and many other Universities are offering online courses for a wide stream of subjects

MOOC in KUFOS

Vision: To create an education platform in consortium with top organizations of the country, to offer courses online for all in the field of Fisheries and Ocean Studies

Mission: To provide 100 online courses with a gross enrollment of 1 lakhs users by 2020.

Steps taken

A dedicated website mooc.kufos.ac.in has been launched and the details on student registration, courses being offered and the mode of functioning of MOOC platform has been uploaded. A dedicated server was purchased and a server space of 1 GB was also purchased exclusively for hosting MOOC programmes. A survey among the student fraternity of KUFOS on the type of courses they would like was conducted. Similarly an analysis of other existing MOOC website (NIDM, courser.org, MIT open courseware, Futurelearn.com, Edumine, Accountingcoaching.com) was also done to identify the most sought after MOOC course. Based on which a list of 32 potential courses that can be initiated under MOOC has been identified and as a preliminary step initial recording of four courses have been completed.

Courses identified for MOOC programme

Sl. No.	Faculty	Course Topic Proposed
1.	Dr. Dinesh K	· Brackish water fish culture · Marine Ornamental Fish Keeping
2.	Sri. N.N. Raman	· Basic course on Meteorology
3.	Dr. Justin David	· Basic course on Bioinformatics
4.	Dr. M.P.Prabhakaran	· Biodiversity Assessment and Management
5.	Dr. K.V. Jayachandran	· Awareness on marine fisheries of Kerala
6.	Dr. Shyama S.	· Setting up, maintenance and management of freshwater aquarium
7.	Dr. S. Rajendran	· Basic course on Geo-technology · Basic course on Disaster Management
8.	Dr. Ambilikumar V.	· Book keeping and cash book maintenance
9.	Dr. Sadasivan Pillai	· Law of the Sea
10.	Dr. Benny Peter	· Introduction to Coastal Zone Management
11.	Dr. ChiranjivPradhan	· Feed and Feed Management in Aquaculture
12.	Dr. Anu Gopinath	· Introduction to Marine Chemistry · Basics of Spectrophotometry
13.	Dr. Rajeev Raghavan	· Fish Taxonomy
14.	Dr. Swapna Antony	· Fish diseases and diagnosis
15.	Dr. Devika Pillai	· Shrimp Disease and Surveillance
16.	Dr. Pramila S	· Inland Fishery Resources
17.	Sri. Anvar Ali PH	· Endangered Fish Species and Management
18.	Dr. Safeena M.P.	· Microbial Quality of seafood
19.	Dr. Abhilash Sasidharan	· Assessing food quality of seafood · Adulterants in seafood and Safety
20.	Dr. Ranjeet K	· Introduction to Biological Oceanography
21.	Dr. Suresh Kumar S	· Basic course in Marine Ecology
22.	Dr. V.K. Venkataramani	· Marine Biodiversity
23.	Dr. Binu Varghese	· Freshwater ornamental fish culture
24.	Dr. Linoy Libini	· Seed production and farming of bivalve molluscs
25.	Dr. Mithun Sukumaran	· Recirculation system in aquaculture · Live feeds in aquaculture
26.	Dr. M.K. Sajeevan	· Oceanic Fish Resources and their management
27.	Dr. Jayalakshmi K.J.	· Zooplanktons and their trophic roles
28.	Dr. Rejish Kumar V.J.	· Soil and water quality in Aquaculture
29.	Dr. Daisy C. Kappen	· Extension Teaching Methods
30.	Dr. S.M. Raffi	· Marine Pollution
31.	Dr. Preetham E.P.	· Introduction to Basic Biochemistry
32.	Dr. Blossom K.L	· Nutritional aspects of fish

MOOC class room at KUFOS



A core committee was constituted which would also act as an Academic Committee for the smooth conduct of the programme. A general guideline for the MOOC programme in KUFOS was prepared and the details are as follows:

Guidelines for coordinators offering massive online open courses

Kerala University of Fisheries and Ocean Studies (KUFOS) propose the following general guidelines for creating Massive Open Online Courses (MOOCs). These recommendations have been formed based on a review of MOOCs offered by peer institutions, deliberations made by the MOOC core committee, and in due consultation with Amrita Vishwapedam, the technology support for MOOC in KUFOS.

Identifying potential subjects

It has been widely discussed about the relevance of KUFOS offering MOOC programmes through its platform, however, the coordinators are encouraged to propose courses that have specific inclination to fields of Fisheries and Ocean Studies in which KUFOS has reasonable expertise. It is also proposed that the coordinators may do a brief search for the availability of such courses elsewhere in the web. Allowances for variation should be considered, as appropriate, based on audience needs, desired learning outcomes, and resource constraints.

General Course Structure

In order to retain as many students as possible, a MOOC should be taught over as short a time period as is reasonable to deliver rigorous content. To that end, KUFOS recommends that MOOCs be approximately eight weeks in length, allowing for variation based on

each MOOC's content and design. However existing MOOCs elsewhere have ranged in length from six to 12 weeks. An eight-week MOOC will allow for delivery of substantial content, while not being perceived by students as overly burdensome. Hence after identification of the course the coordinators should prepare a course module, encompassing the contents in such a way that the course would be complete within 8- 10 sessions of one hour lectures. Likewise, it is also requested that the supporting documents in the form of powerpoints, video clips etc. required for sessions may be prepared well in advance. It is envisaged to record individual lectures through A-view the interactive platform at the video conferencing facility of KUFOS and the coordinators are requested to record 50% of the total course lectures in order to start the MOOC course.

Best practices further suggested

Each week of the MOOC be comprised of a lesson with a single topic or themed topics with specified learning outcomes

Learning assets be available at all times so that students across the world can participate fully, no matter the time zone or personal schedule. The video of a particular lecture would be available for the students to view and download for a period of one week after which they would be archived.

Each MOOC be designed according to a rigorous instructional design process and course functionality subjected to a quality assurance process. The Academic committee shall be responsible for checking plagiarism and copyright issues. It is also suggested that the course content be laid with a watermark logo of KUFOS in order to avoid online piracy of materials.

Communication with students should be very clear and consistent and instructors should be very clear about their expectations as well as setting student expectations for the course. Students tend to leave the course if there is confusion. It is also envisaged to conduct a live interaction session at the end of each module, where selected queries from the students shall be answered by the experts.

Course and instructor encourage and enable emergence of learning communities where students connect with each other and with course materials. A repository of the course material shall be retained in KUFOS for further use and modifications, if needed.

Promo

Once the course materials and modules are ready

KUFOS intends to attract online users to its MOOC programme through short promo videos (15-20sec) providing a curtain raiser about the proposed course. In this respect the coordinators are required to prepare a brief write up about the MOOC emphasizing the importance and uniqueness of the course. They can record a video showcasing the facilities available, scope of the subject and through a voice over provide this as a flier for the proposed course at least two weeks prior of starting registration.

Registration & Fee

To start with a database of all the students registering for the course shall be maintained in KUFOS and the same shall be forwarded to Amritha who would assign individual username and password for the users. A student can attend the class only through online registration. At the end of each module or at the end of the course an online test would be necessary for assessing the knowledge base of the student. Successful candidates shall be given certificates of KUFOS, for which a fixed fee (to be decided by the core committee) will have to be paid.

Practice & Engagement

Discussion threads can be used to effectively engage students, who may communicate in discussion board threads each week on key course concepts. These discussion boards are best focused on a case study, problem, or question(s) pertinent to the lesson and should allow participants to share ideas and debate topics. More sophisticated interactive pieces may also be developed, depending on resource constraints. For lessons in which students can appropriately practice skills or concepts, short interactive pieces can effectively supplement other course material.

Assessment

Assessments within MOOCs must accommodate a large number of users and should align with the stated learning objectives, as well as all teaching activities and methods. Ideally, courses should offer both formative assessment to promote deeper learning, critical thinking and reflection, in combination with summative assessments designed to gauge student achievement and/or performance. While any assessment can be formative and/or summative in nature, generally speaking, any activity or assignment that is meant to promote ongoing reflection or help a student improve would be considered formative. Any activity or assignment that results in a final grade or summary, and does not call for additional reflection, would be considered summative. Formative assessments may include ungraded reflection papers, quizzes that can be re-taken, discussion board responses,

as well as self- and peer evaluations that are meant to help student improve or identify gaps and weaknesses. Summative assessments may include graded quizzes, reports or projects, or peer assessments if a grade is attached. All summative assessments should have a due date. After the due date, an answer key with explanations should be provided. Overall, assessments may be self-referenced (designed to prompt reflection on learning and performance); peer referenced (prompting reference on criteria and instructor/course expectations); or instructor (computer-mediated).

The decisions to use different types of assessments should be based on the stated learning objectives for the class

Certificates

Each MOOC is a certificate course. On successful completion of the course students shall be provided a certificate of completion. It is advised that each MOOC programme has a definite template for certificate that can be designed and displayed before the start of each course to attract more students.

Feedbacks

At the end of each course students are encouraged to provide responses on end-of-course surveys. A module or questionnaire in this respect may be prepared by the coordinator to evaluate the effectiveness of the course.

Copyright and Intellectual Property

When creating and teaching MOOCs, copyright and other intellectual property issues typically arise in two contexts: 1) appropriate and allowable use of pre-existing material (images, video, texts, etc.) within the MOOC and 2) ownership of the newly-created MOOC course materials. Each MOOC will likely present different contexts and needs that will necessitate case-by-case identification of intellectual property issues and processes. It is thus encouraged that each coordinator submit the teaching materials well in advance to the academic committee to avoid any copyright issues.

Technical Support

All the technical support required for the preparation, documentation, editing, assessment and evaluation of the course shall be provided by the KUFOS MOOC technical committee. The help of Amrita Vishwapedam can also be availed for customizing the course content and delivery.

Other Extension activities

Plastic Waste Free Campaign (Swachhata Hi Seva 2019) from 11th September to 27th October 2019

On account of the Prime Minister's call during his Independence day speech on 15th August 2019 to take action for plastic waste management, it has been decided to focus the theme of Swachhata Hi Seva -2019 on plastic waste management. Department of Drinking water and Sanitation is the nodal department for this campaign. With a firm focus on Sramadan for plastic waste collection on 2nd October the, 150th Birth Anniversary of Mahathma Gandhi, the campaign seeks to reenergize the Swachh Bharat Janandolan and accelerate plastic waste management in villages, Urban local bodies (ULBs) and public places including religious places, schools, railway stations, hospitals etc. Following the presentation made on the campaign at the meeting chaired by the Principal Secretary to the Prime Minister on 22nd August 2019, the Department of Higher Education is requested to lead this campaign for awareness generation, collection and segregation of plastic waste at institution across the country. For this, the department is requested to undertake the following during SHS 2019.

- All colleges may have special plastic waste awareness generation activities for students
- All colleges may perform Sramadan in and around their institutions on 2nd October
- Arrange for collection and transport to nearest collection hub.
- National level essay competition among students on Plastic Waste Free India
- The Ministry is also requested to examine other possibilities through which they can contribute to the success of the campaign.

The Secretary, Department of Drinking water and Sanitation has directed to observe Plastic Waste Free Campaign (Swachhata Hi Seva 2019) from 11th September to 27th October 2019 and requested all the heads of the Universities and colleges to undertake activities suggested during Swachhata Hi Seva 2019.

To chalk out and implement various programmes in the University a meeting was organized on 26/8/2019 in the conference hall of the University and the following decisions were taken.

1. To assess / quantify micro plastics and pollution load including microbial contamination in the Marine Drive
2. Collection of plastic items from the intertidal area of the Marine Drive
3. Dredging for collection of settled plastics
4. Quantification of micro plastics in the water column and sediments
5. Categorization of the plastics and quantification thereof
6. Conducting awareness programmes to public involving Cochin Corporation, District administration, GCDA and NSS volunteers from other colleges in and around Cochin
7. To take permission from the concerned authorities
8. To have a meeting/workshop during the 1st week of September to finalize the activities with Cochin Corporation, GCDA, District administration and NSS volunteers from other colleges in and around Cochin City.

In connection with the above programme, to implement the above decisions a "Plastic waste free campaign" was launched at Marine Drive, Kochi on 16/10/2019. The procession started from Boat jetty, Kochi to Marine Drive at 8am. NSS volunteers and students from various schools of KUFOS participated in the procession. Appropriate banners and placards showing the hazards of unrestricted use plastics were displayed during the procession for creating public awareness. Gumboots, hand glows, masks, shirts and caps with KUFOS emblem were distributed to the students. The students collected the plastic waste during the procession and sorted into different categories. Publicity and media coverage, photography and video coverage and refreshments to the staff and students were arranged during the programme. After the procession a meeting was organized. Prof. (Dr.) A. Ramachandran, honorable Vice Chancellor, KUFOS inaugurated the programme. KUFOS Registrar Dr. B Manojkumar was presided over the function. Dr. M Sudhakar, MD, CMLRE, KUFOS Senate members T Peter, V Gabriel, Director of Research Dr. T V Sankar, Director of Extension Dr. Daisy C Kappen and Mr. Moosakutty, Manager BPCCL were among those who spoke in the awareness programme function.

Meeting organized as part of the Plastic Waste Free Campaign (Swachhata Hi Seva 2019)

Plastic waste collected



മാതൃഭാഷാദിനം

Honorable Vice Chancellor, KUFOS,
 Prof.(Dr.)A Ramachandran inaugurating the Malayalam Day celebrations
 on Nov.1st 2019 at KUFOS Seminar hall



കേരളസർക്കാരിന്റെ നിർദ്ദേശാനുസരണം കഴിഞ്ഞവർഷങ്ങളിൽ എന്നത്പോലെതന്നെ ഈ വർഷവും നവംബർ 1 മലയാള ദിനമായും നവംബർ 1 മുതൽ 7 വരെ ഭരണഭാഷ വാരമായും ഷിഷിറീസ് സർവകലാശാല ആചരിച്ചു. വിജ്ഞാന വ്യാപനവിഭാഗത്തിന്റെയും സ്റ്റാഫ്ക്ലബ്ബിന്റെയും സംയുക്തആഭിമുഖ്യത്തിൽ ആയിരുന്നു ചടങ്ങ് സംഘടിപ്പിച്ചത്. ബഹുമാനപ്പെട്ട സർവകലാശാല വൈസ്ചാൻസിലർ പ്രൊഫസർ (ഡോ) എ രാമചന്ദ്രൻ ഉദ്ഘാടനം നിർവഹിച്ചു. പ്രശസ്ത എഴുത്തുകാരിയും വിവർത്തകയുമായ പ്രിയ എസ് നായർ മുഖ്യഅഭിനി യായിരുന്നു. രജിസ്ട്രാർ ഡോ. മനോജ്കുമാർ അധ്യക്ഷതവഹിച്ച ചടങ്ങിൽ ഡോ. ടിവിശങ്കർ, ഡോ. ഡെയ്സി സി കാഷൻ, ശ്രീ. കെ കെ രഘുരാജ്, ജോബി ജോർജ്ജ് തുടങ്ങിയവർ സംബന്ധിച്ചു. തുടർന്ന് വൈസ് ചാൻസിലറുടെ നേതൃത്വത്തിൽ നടന്ന ഭരണഭാഷ പ്രതിജ്ഞയിൽ എല്ലാ അധ്യാപക അനധ്യാപക ജീവനക്കാരും പങ്കാളികളായി. മലയാള ഭാഷയിൽ ശ്രദ്ധേയമായ സംഭാവനകൾ നൽകിയ കുഷോസ് കുടുംബങ്ങളായ ഡോ കെദിനേശ്, ധന്യ ടി എം എന്നിവരെ വൈസ് ചാൻസിലർ ആദരിച്ചു. തുടർന്ന് മലയാളഭാഷയും മലയാളിയും എന്നവിഷയത്തെ ആസ്പദമാക്കി മുഖ്യഅഭിനി പ്രിയ എസ് നായർ പ്രഭാഷണം നടത്തി . മലയാളഭാഷ ചരിത്രത്തെയും സാഹിത്യത്തെയും മുൻനിർത്തിയുള്ള പ്രത്യേക പുസ്തകപ്രദർശനം വൈസ്ചാൻസിലർ ഉദ്ഘാടനം ചെയ്തു. കുഷോസ് സെമിനാർ ഹാളിൽ സർവകലാശാല ജീവനക്കാരുടെ മലയാളത്തിലും പാരമ്പര്യവും വിളിച്ചോതുന്ന തിരുവാതിരയുടെ അവതരണവും മത്സരവും നടന്നു. ഷാം ജീവനക്കാർ അവതരിപ്പിച്ച നാടൻപാട്ടുകളും ശ്രദ്ധേയമായി. ഡോ കെ ദിനേശിന്റെ നേതൃത്വത്തിൽ മലയാളഭാഷചരിത്രം, സാഹിത്യം എന്നിവയെ ആസ്പദമാക്കി പ്രശ്നോത്തരിയും സംഘടിപ്പിച്ചു. ഭരണ ഭാഷവാദാഘോഷത്തിന്റെ ഭാഗമായിസർവകലാശാല വിജ്ഞാന വ്യാപനവിഭാഗത്തിന്റെ നേതൃത്വത്തിൽ ഓഷിസു കളിൽഓരോദിവസവും ഭരണരംഗത്ത് ഉപയോഗിക്കുന്ന അഞ്ച് ഇംഗ്ലീഷ് പദങ്ങളും സമാന മലയാളപദങ്ങളും എഴുതി പ്രദർശിപ്പിച്ചു. കൂടാതെ ഭരണഭാഷയുടെ പ്രസക്തിയെ സൂചിപ്പിക്കുന്ന ബാനറുകൾ സർവകലാശാലയുടെ മൂന്ന് ക്യാമ്പസുകളിൽ പ്രദർശിപ്പിക്കുകയും ചെയ്തു.

CONCLUSION

Kerala University of Fisheries and Ocean Studies (KUFOS), the first fisheries University in the country was established for the development fisheries and ocean studies in the State of Kerala. The University has excellence in the field of teaching, research and extension so far. Department of Extension under KUFOS at present is implementing 14 extension projects funded by Government of Kerala aimed at the integrated development of the community, viz. social, cultural, financial etc. These projects significantly contributed to improving the quality of life of the fisherfolk and fish farmers and also helped in enhancing their socio economic status and welfare. The projects like “Village Adoption for empowerment and Capacity building ensuring livelihood of Fisherfolk in Central Kerala” aimed at empowering the fish farmers of the Panchayaths also helped to preserve the indigenous fish species that are facing threat leading to their extinction.

The Directorate of Extension has introduced an environment - friendly farming system focusing freshwater fish/prawn culture, brackish water fish/shrimp culture, ornamental fish culture, cage culture integrated farming etc. by utilizing the resources available in private and public sectors of the villages. Besides being efficient in transfer of relevant technology to the fisherfolk including women beneficiaries it was with a gender sensitive approach that the projects were implemented. Through constant and indoubtable effort the rate of adoption of the technologies by the farmers in the adopted villages increased to a great extent and the technology gap existing at present between the research system and the farmers could be minimized.. The appreciations by the print media, general public and the eagerness and enthusiasm of the farmers to attend the training programmees conducted by the Directorate of Extension can be considered as the reflections of the high standard and commendable performance of the department.







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