

**KERALA UNIVERSITY OF FISHERIES AND OCEAN STUDIES, (KUFOS)
PANANGAD, KOCHI**

**DIRECTORATE OF EXTENSION
REPORT ON THE EXTENSION ACTIVITIES OF THE DIRECTORATE OF EXTENSION
(2018-19)**

Funded by Government of Kerala

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KUFOS(2018-19)**

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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 and 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 has witnessed tremendous developments both aquaculture and capture sectors. 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 fisherfolk, 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 activities. Taking into account these aspects, Kerala University of Fisheries and Ocean Studies (KUFOS) has implemented various extension projects aimed at the development of the fisheries sector. These projects have helped in creating mass awareness about the various technologies in the field of fisheries, in augmenting fish production and protein supply by adopting innovative aquaculture practices in an eco-friendly and sustainable manner, creating more employment opportunities, leading to an increase the income and quality of life of the fish farmers and ensuring livelihood security to the fisherfolk and fish farmers in the State of Kerala.

2.Extension Projects

Directorate of Extension, Kerala University of Fisheries and Ocean Studies (KUFOS) implemented the following Plan Projects funded by Government of Kerala during the year 2018-19

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

Kerala University of Fisheries and Ocean Studies (KUFOS) implemented the Plan Project “Village Adoption for Empowerment and Capacity Building Ensuring Livelihood of fisherfolk 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 fisherfolk, thus ensuring livelihood security to them. The project also focuses on transfer of post harvest technologies to the fisherfolk with special emphasis on women empowerment .

As part of the project, with a view to ascertaining the culture prospects of seabass as a candidate species for pen culture, KUFOS conducted a trial culture cum demonstration of pen culture of seabass at Thiruthipuram, N.Parur. Five hundred numbers of seabass seeds purchased from Rajiv Gandhi Centre for Aquaculture (RGCA), Sirkali was introduced in the pen (80m²) constructed in Thiruthipuram backwaters. After a period of culture of one year, the stocked fishes were harvested on 26/5/2018. Total production was 618kg with a survival rate of 96.6%. Maximum size of the fish was 2.330kg and the fishes were sold at selling price of Rs.450/kg. Culture of seabass in pens was the first attempt in Kerala. Successful conduct of this trial culture cum demonstration indicates the prospects of pen culture of seabass as a candidate species for pen culture. The trial culture also proved that it is a cost effective technology which could be extended to further areas and the farmers can adopt it without much capital investment for increasing their income through fish production.

Harvesting of the Seabass at Thiruthipuram on 26/5/2018



Harvested fishes



Cage and pen culture units started

During the year 2018-19 University provided both technical and financial support to the fish farmers interested in cage aquaculture and pen culture at various places viz. Kottuvally, Kaitharam, Methala, Poyya, Puthenvelikkara, Aroor, Arookutty, Vadakkumpuram, Varappuzha, Gothuruth, Thattappilly Chendamangalam, and Panangad. These units were stocked with commercially important cultivable fishes like Pearlsport, Seabass, Red snapper etc. Altogether the University has started 23 cage aquaculture units comprising 45 beneficiaries. In penculture, support was given to three groups consisting of seven - member farmers .To know the prospects of simultaneous culture of Seabass and pearlspot a demonstration pond of 1 acre was selected at Panangad and stocked with 1300 numbers of seabass and 1500 numbers of pearlspot which was not fully successful on account of the devastating flood occurred during the last week of August 2019.

Stocking of the demonstration pond at Panangad on 2/4/2018



Stocking the cages at Panangad on 4/4/2018



Growth assessment of the pearlspot



To know the impact of the project a joint physical verification of the project was carried out by the AG Audit party on 14/6/2018. The team members comprising N.V.Surendran, Sr.Audit Officer, Geo Jose, Asst.Audit Officer, P.B.Dineshkumar, Asst. Audit Officer visited various sites and conducted physical verification at four brackishwater fish farming sites at Arattukadavu, Kottuvally and Cheriappilly including the demonstration unit established at Thiruthipuram where innovative techniques like Cage aquaculture of variety species viz.seabass, pearlspot, red snapper etc. and pen culture of commercially important fishes were being carried out since 2011. The audit team reported that among the various technologies, the technology of cage aquaculture, both selective stocking and Capture Based Aquaculture system (CBA) and pen culture of variety species has been found to be most profitable, cost - effective, less capital intensive and less risky in nature

which could be viewed as a desirable model of sustainable fisheries development for rural empowerment and food security for the fish farmers in various coastal Grama Panchayaths

Demonstration unit established at Thiruthipuram



Visit of the AG Audit wing on 14/6/18





Partial harvesting of the stocked fishes at various places were carried out

Partial harvesting at Kottuvally on 21/8/2018

Name of farmer : Arun T R

Place : Kottuvally

Cage dimension : $3*3*1.5 = 13.5m^3$ (one cage size)

No of cages : 4

No of seeds stocked : 1500

Survival rate 80%

Culture period :8 months

Total quantity of harvest - 400 kg



Harvesting at Manjali on 23/8/2018

Name of the farmer :Anas K. A

Total number of cages : 9

Quantity harvested : 742.5kg

Survival rate : 78%



Partial harvesting on 25/7/2018 from the demonstration unit (pen culture) established at Panangad



Partial harvesting of the cage culture unit at Panangad on 25/7/2018



Effect of Flood during August 2018

Considering the prospects of cage aquaculture as an important means of increasing the fish production from unit area, providing livelihood security to the fisherfolk etc. the project “Village Adoption” was given more emphasis in promoting this particular technology among the fisherfolk along the coastal area from the time of its inception. Under RKVY - funded project “Sustainable Fisheries Development for Food Security in Puthenvelikkara Grama Panchayath (SamagraMatsyaGramam) implemented during the period from 2010 to 2014 the technology of cage culture of variety species has been standardized and successfully demonstrated to the farmers. The present project was also implemented in a similar way from 2015 onwards. During the year 2017-18 this technology was disseminating at a faster rate among the fisherfolk, and more and more farmers were attracted to this and they came forward to adopt this novel technology. The University took necessary steps in promoting this practice by conducting training cum demonstration programmes in prospective areas and provided both technical and financial support to the farmers in starting small scale units. Altogether 53 units consisting of 162 beneficiaries were established at various places viz.Kottuvally, Chendamangalam, Cheruveypu etc. during the year 2017-18 and was expecting a minimum production to the tune of 50 tons from these units. The project team regularly visited the units and provided necessary advice to the beneficiary farmers so as to make this venture successful. Unfortunately, due to the occurrence of the devastating flood during the month of August 2018 completely wiped out the coastal areas where the cages were established, totally shattering the units and causing huge losses to the beneficiary farmers. The survey conducted in these areas indicated that mass mortality of the

stocked fishes was due to accumulation of mud in their gills and consequent death. Only very few demonstration units could be retained.

Glimpses of the effect of the flood upon the cage Aquaculture units established at Kottuvally and Manjali before and after the flood during the month August 2018

**Cage culture units established at Kottuvally-
Before the flood**



After the flood



Cage culture units established at Manjali

Before the flood



After the flood



Fish Farmers Day celebrations- Training programme on Freshwater Fish Culture from 10/7/2018 to 13/7/2018 (4 days)

It was in 2001 that the Government of India declared July 10 as Fish Farmers Day to honour scientist Hiralal Choudhary, and Dr.K.H.Alikunji who successfully conducted induced - breeding in Indian major carp fish during the year 1957.KUFOS celebrated “Fish Farmers Day” on 10/7/2018 and a four - day training programme on “Freshwater Fish culture “was organized from 10/7/2018 to 13/7/2018 at KUFOS Headquarters. A field visit was also organized on the last day of the training programme..The programme was inaugurated by the honorable Vice Chancellor of KUFOS Prof.(Dr.)A.Ramachandran and presided over by Dr. V.M Victor George, Registrar, KUFOS. Dr. K.V Sugunan, Former DDG(ICAR) delivered the keynote address. Dr.TV Sanker, Director of Research and Dr.K.Gopakumar, Professor of Eminence offered felicitations on this occasion. Scientists of KUFOS engaged classes for the farmers on the topics viz. freshwater fish farming, Tilapia culture, Artificial feed formulation,, live feed culture, fish diseases and remedial measurers,

freshwater prawn farming, breeding and culture of indigenous fishes and Aquaponics. In all 75 farmers attended the training programme.



II. Earn While You Learn (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 of 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 2018-19, 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 2018-19 enabled capacity building and skill development among the B F Sc students, and 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 contributed to personality and leadership development. It also helped in increasing their confidence and enhanced their ability to manage the Aquaculture activities. Under this project, farm equipments and accessories required for carrying out various aquaculture activities were purchased, breeding and rearing of different fishes were carried out and generated revenue from the culture of GIFT strain Tilapia, Mullet, Nile tilapia, Red tilapia, Angelfish, Pearlscale etc. Apart from this the scheme produced pesticide - free vegetables also. The total income generated by the project is Rs. 64,179/- (Rupees Sixty four thousand one hundred and seventy nine only) till the end of FY 2018-19. B.F.Sc students of 2014, 2015, 2016, 2017 batches were involved in the activities and sales were done through farm office.

Presently culture of the following fishes and activities are progressing :

- Pearlscale – seed production and rearing
- Red tilapia – seed production and rearing
- Angelfish - seed production and rearing
- Koi carp – seed production and rearing
- Giant gourami – seed production and rearing
- Climbing perch – seed production and rearing
- Stinging catfish – farming Moringa trees, Red lady papaya also were planted.

Harvesting of the stocked fish by BFSC 2017 batch students



The EWYL programme implemented by the Department of Fish Processing Technology under the Faculty of Fisheries provided an opportunity for the students for 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. seafood by-products, biochemistry and microbiology laboratories. The students were divided into different groups and each group was provided with 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, B F Sc 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.

Preparation of Value- added products by BFSc 2015 batch



Products prepared



Department of Food Science and Technology under School of Ocean Science and Technology (SOST), KUFOS initiated the “Earn While You Learn Programme” for the year 2018 with the ‘Culinary Enterprise’ titled ‘YUMMY TUMMY 2K18’ on July 2-3rd, 2018 by engaging 2017 batch M.Sc.Food Science and technology students. The programme provided opportunities for the students to generate income through entrepreneurial projects, thus preparing them to shoulder professional assignments with relative ease and it proved to be an excellent exposure and beneficial learning activity for the students. As per the Food Science and Technology practical syllabus the students are required to prepare and analyze various products viz.preservation of cereals, legumes and oil seeds, fruit and vegetable products ; meat, poultry and dairy products,fish products etc. Snacks including chicken wraps, vegetable cutlets, ice creams of different flavours and beverages were the main items prepared by the students and put up for sale at the main lobby of the Administrative block at the University. All the 30 students took active part in organizing the sale. Different committees viz. Stall committee, Culinary committee, marketing committee,

finance committee, sales committee, cleaning committee etc. were also constituted for the smooth conduct of the programme. The University provided its budding entrepreneurs with all the necessary guidance as well as resource to initiate, plan and execute their entrepreneurial ventures.

Preparation of Value added products by M Sc Food Science and Technology (Batch 2017)



Marketing of the prepared products.



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 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 agencies concerned. 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. A Cameraman cum NLE Editor and a Production Associate have joined in this project during the month of November 2018. 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.14,900/- (Fourteen thousand and nine hundred only) has been earned during the year 2018-19 by outsourcing the studio facilities. The following activities were carried out during the year 2018-19.

Workshop on Script writing

A one - day workshop on script writing was organized on 27/9/2018 as part of the project to familiarize faculties and Research Fellows in script writing who may involve in the production process of documentaries. Mr Rajagopal K of Media Research Foundation, a well - known documentary, script writer and a full bright fellow in media science engaged classes to the faculties and Research Fellows. Both theory and practical sessions were scheduled in this workshop and altogether 27 participants attended the workshop.

Honorable Vice Chancellor Prof.(Dr.)A.Ramachandran addressing the participants



Mr Rajagopal K of Media Research Foundation is engaging classes



Activities of the Audio-Video recording Studio during the period November 2018-March 2019
NOVEMBER 2018

- Visited cage and pen culture units installed at various places viz. Thiruthipuram, Kottuvally so as to familiarize the technologies of cage culture and pen culture for production of a video film on cage aqculture and pen culture
- Visited various departments of KUFOS to know the activities so as to produce a video film about the University.
- Photo session of the programme organized by Rotary club at KUFOS on 16/11/18
- Photo session of the foundation stone laying of the new building at Administrative block by honorable Vice Chancellor on 22/11/18
- Photo session and video shoot of the programme by Rotary club on 27/11/18
- Video recording at the Public Aquarium, KUFOS on 29/11/18
- Photo session of public aquarium visit of the students from Bhavan's school on

30/11/18

DECEMBER 2018

- Video- photo coverage of the Open Day conducted on December 3rd-2018 at KUFOS as part of the celebrations of the “Agricultural Education Day”
- Sorting and editing of the photos and videos produced on 3/12/18
- Photo and video shoot of the aquarium visit of the students from Bavans School & MOU signing at conference hall on 5/12/18
- Photos and video shoot of the Academic Council meeting at conference hall and pledge taking in connection with the human rights day on 10/12/18
- Photo session of the Task Force constituted by KUFOS for studying the impact of recent river/dam flood into inundation and to submit the mitigation measures in Kerala river basin & Capacity building workshop on 11th and 12th December 2018
- Video shoot of Buoy deployment with respect to KUFOS-INCOIS project” Establishment of wave observation at two location of Kerala Coast at Puthiyappa, Kozhikode from 13/12/18//to 15/12/18 (3 days)
- Photo session at Fort Kochi Jetty & Thoppumpadi port as part of the KUFOS-INCOIS project” Establishment of wave observation at two location of Kerala” on 18/12/2018
- Edited video on BOYA Deploying at Calicut organized by School of Ocean Science Technology as part of their project on 20/12/18
- Edited video on Capacity building workshop on 21/12/2018
- Photo & video shoot of the Christmas Celebration at KUFOS on 22/12/2018 & Fish Harvesting of the demonstration unit at Cheppanam 22/12/2018
- Photo session of the training programme on advanced techniques in Aquaculture from 27th to 29th December 2018
- **JANUARY 2019**
- Photo coverage on New Year celebration on 1/1/2019
- Photo session of Cancer Care Medical Camp Inauguration on 4/1/2019
- Photo coverage of students visiting aquarium on 5/1/2019
- Photo session of GEM meeting at conference hall on 10/1/2019
- Video shoot of soil and water sample collection by Dr. Anu Gopinath and team at Kollam Asraam and Munrothuruth on 12/1/2019
- Photo session of M. Tech students Seminar on 14/1/19.

- Photo coverage of University student's Union oath taking ceremony on 14/1/19.
- Video shooting of aqua culture lab, hatchery, ponds, food processing lab, library etc from 15/1/19 to 17/1/19 for the production of video film of the University
- Photo coverage of Governing Council Meeting on 21/1/19.
- Video shoot for the production of video film of the B.Tech Food Technology course, School of Ocean Engineering and Under water Technology on 22/1/19 for getting AICTE approval
- Photo session and audio recording of the National Workshop conducted by Library Dept. on 22/1/19 and 23/1/19.
- Video shoot for the production of video film of the B.Tech Food Technology course, School of Ocean Engineering and Under water Technology on 24/1/19 for AICTE approval.
- Video shoot of the pond renovation by B F Sc students in the western campus on 25/1/19 for production of University film.
- Photo coverage of the Republic Day celebrations on 26/1/2019
- Photo session of the One day training programme on "Production and Marketing of value added products from seafood" organized at KUFOS on 26/1/2019
- Video shoot of the UG Ladies Hostel for the production of University film on 29/1/19.
- Photo session of the building construction at KUFOS Main campus by the Engineering department on 29/1/19
- Video editing of the film of the B.Tech Food Technology Course, School of Ocean Engineering and Under water Technology for AICTE approval on 29th and 30th January 2019
- Video shoot of Kole wet land fish survey of Trissur and Ponnani Koles in association with College of Forestry, Kerala Agricultural University from 31/1/2019 to 3/2 2019 (4 days)
- Photo session of the seminar conducted by CASRED on 31/1/19 and video coverage of the Students Union inauguration.

FEBRUARY 2019

- Photo session of ERUDITE programme 2019 by Dr.Bent Enserinck, Netherlands on 7/2/2019 and 8/2/2019
- Video shoot of fish harvesting from the ponds near to the Type II

quarters on 13/2/2019

- Photo session of new fortunes in application of analytical science and technology on 14/2/2019
- Photo session of the book fest inauguration on 15/2/2019
- Video shoot on fish harvesting at Puthuveypu Research Station on 21/2/2019 for the production of University film and photo coverage of the Task Force constituted by KUFOS for studying the impact of recent river/dam flood into inundation and to submit mitigation measures in Kerala river basin to the Govt. of Kerala.
- Video coverage of the seminar on Disaster Management on 22nd and 23rd February 2019.
- Photo session of the web telecast of Prime Ministers Pradhan ManthriKisan Samman Nidhi on 24/02/2019
- Video coverage of the Public Aquarium and Museum for the production of University film on 25/2/2019.
- Video coverage of the Fish processing lab for the production of University film on 26/2/2019
- Photo coverage of the celebrations of the National Science day on 28/2/2019

MARCH 2019

- Photo coverage of the Training programme on Ornamental Fish Culture from 5/3/2019 to 9/3/2019
- Photo Coverage of talk by Prof.Peter KL Ng of the National University of Singapore on 11/3/2019
- Video shoot of the PG Ladies Hostel for production of University film on 19/3/2019
- Photo coverage of the KUFOS tie-up with KSREC on 23/3/2019
- Photo coverage of the two - day National Seminar on River and Wet lands organized by Dept. of Aquatic Environment Management and KUFOS on 28th and 29th March 2019

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 through out 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 centre 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 centre established at KUFOS. The centre 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 centre

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. Through this plan project “Farm Advisory Services” the University is providing such type of assistance to the target group. As part of the above Plan Project two training programmes viz. “Recent trends in aquaculture” and “Ornamental Fish Culture” were organized during the year 2018-19

1.Training programme on “Recent trends in Aquaculture” from 27th to 29th December 2018

The training programme on “Recent trends in aquaculture” was organized from 27th to 29th December 2018 at KUFOS Seminar hall. Prof.(Dr.)A Ramachandran, the honourable Vice Chancellor of KUFOS inaugurated the function and Dr.V.M Victor George, the Registrar of KUFOS presided over the function. Scientists and experts both from KUFOS and Department of Fisheries, Govt. of Kerala engaged classes on various topics viz, freshwater fish farming, cage culture, pen culture, GIFT tilapia culture Aquaponics artificial feed preparation, live feed culture, fish diseases and remedial measures, biofloc, indigenous fishes and their breeding etc. A field visit was also organized as part of the training programme. Altogether 75 farmers attended the training programme.

Prof.(Dr)A. Ramachandran, Honorable Vice Chancellor of KUFOS inaugurating the training programme



Field Visit at KUFOS Western Campus.



2.Training programme on Ornamental Fish Culture from 5/3/2019 to 9/3/2019

A Training programme on “Ornamental Fish Culture” was organized at KUFOS from 5/3/2019 to 9/3/2019 . The programme was inaugurated by Prof.(Dr.)A Ramachandran, the honourable Vice Chancellor of KUFOS. Scientists and experts both from KUFOS and Department of Fisheries including the entrepreneurs in the ornamental fish culture industry engaged classes for the farmers on various topics viz. Ornamental fish culture - prospects and problems, aquarium plants, Live bearing fishes, Egg laying fishes, fish diseases and remedial measures, Live feed culture, preparation of artificial feed, construction and maintenance of aquarium, etc. In all, fifty farmers attended the training programme.

Prof.(Dr)A. Ramachandran, Honorable Vice Chancellor of KUFOS inaugurating the training programme



Skill Development- demonstrating the construction of Aquarium tanks



Field visit at National Institute of Fisheries Administration and Management (NIFAM, Kadungalloor) on 9/03/2019



VI.Exhibition Unit

Conducting/ participating in exhibitions serve as an important means of

transfer of technology to the fish farmers and fisherfolk in the fisheries sector. Moreover, arranging Aqua clinics along with these exhibitions will ensure the service of the experts working in the different sectors of fisheries and help to solve the problems of the stakeholders to a great extent.

Kerala University of Fisheries and Ocean Studies (KUFOS) is conducting/participating in State/National/ International exhibitions organized by various institutions within and outside State right from its inception and secured many prizes and awards. The exhibition unit established at KUFOS has rich collections of specimens, models of various fishing crafts and gears, visual aids showing the activities and achievements of KUFOS, aquarium tanks for setting up of aquariums including a TV for the display of various activities in the field of teaching, research and extension .

The University participated in 6 exhibitions during the year 2018-19

1Exhibition organized as part of Joint State Level HADR-Humanitarian Assistance and Disaster Relief Exercise/Seminar co ordinated by Southern Naval Command, SDMA, Police, DHS,DMO Fore and Rescue and Other stake holders from 5/4/2018 to 8/4/ 2018 (4days) at Samudrika AuditoriumW Island

Kerala University of Fisheries and Ocean Studies (KUFOS) participated in the Exhibition organized as part of the State Level HADR-Humanitarian Assistance and Disaster Relief Exercise/Seminar at Kochi co-ordinated by Southern Naval Command, SDMA,Police,DHS,DMO Fire & Rescue and other officers of State and District at Samudrika Auditorium, Willington Island, Kochi from 5th to 8th April, 2018. The programme was inaugurated by the hon'ble Chief Minister of Kerala, Sri. Pinarayi Vijayan in the presence of the dignitaries viz.Sri.E.Chandrasekharan, the honorable Minister for Revenue. Govt. of Kerala, Kadannappally Ramachandran, the honorable Minister of Port , Govt. of Kerala and Sri S, Sharma, MLA. A stall of size 6m x 3m.was allotted to KUFOS. Various models of fishing craft, gears, cage culture, visual aids and a video film showing the activities and achievements of the University were displayed in the stall. Govt. Institutions viz. Department of Fisheries, CIFT, District Disaster Management (DDM), Navy, Air Force, Army, NDRF CIFT, CMFRI, MPEDA participated and put up stalls in the exhibition. The exhibition was organized from 11am to 8pm. Seminars on various topics were also organized during these days. Brochures and leaflets showing the activities and achievements of KUFOS in the field of teaching, research and extension were distributed to the delegates and the public.

Exhibition stall set up at Samudrika Auditorium, W.Island from 5th to 8th April 2018



2.Exhibition organized as part of “Samyojitha Krishi Samsthana Silpasalayam Karshika Pradarsanavum” from 11/4/2018 to 15/4/2018 (5days) at Business India Ground, Chengannoore

As per the request of the Convener of the exhibition committee “Samyojitha Krishi Samsthana Silpasalayam Karshika Pradarsanavum” Kerala University of Fisheries and Ocean Studies (KUFOS) participated in the Exhibition organized at Business India Ground,Chengannoore from 11/4/2018 to 15/4/2018. The programme was inaugurated by the hon’ble Minister of Agriculture, Govt of Kerala Sri.V A Sunikumar at 4pm on 11th April , 2018 in the presence of various dignitaries. Seminar, workshops, discussions, entertainment programmes, agricultural exhibitions etc were arranged during these days. The exhibition was organized from 11am to 8pm. Department of Agriculture, ADAK, Horticulture Mission and Horti Corp, Animal Husbandry Department and Co- Operative Societies participated and put up stalls. A book fair was also organized along with the exhibition in which Mathrubhumi, Malayala Manorama, Desabhimani etc participated. A stall of size 6m x 3m.was allotted to KUFOS. Various models of fishing craft, gears, cage culture, visual aids and a video film showing the activities and achievements of the University in the field of teaching research and extension were displayed in the stall. Brochures and leaflets were also distributed to the delegates and the public.

Honorable Finance Minister Sri.Thomas Issac and Sri. Saji Cherian, MLA are visiting KUFOS stall on 11/4/2018



3.Global Organic Meet 2018, second International Seminar on Emerging trends in Organic Farming and Sustainable Agriculture from 21/4/2018 to 24/4 /2018 (4 days) at CMS College, Kottayam

The Exhibition “Global Organic Meet” (Prakruthi) was organized at CMS College, Kottayam from 21st to 24th April 2018. The programme was inaugurated by Sri.P.Thilothaman, the hon’ble Minister for food & Civil Supplies, Govt. of Kerala and presided over by Dr.Babu Sebastian, the hon’ble Vice Chancellor of Mahatma Gandhi University in the presence of various dignitaries at 4 pm on 21/4/2018. Dr.A.Jose, Dr.K.Krishnadas and Dr.R.Pragash syndicate members offered felicitations. Seminar on Modern trends in Organic and Sustainable Agriculture, workshops, deliberations, practical sessions on organic farming, forest walk experience, agricultural film festivals, tribal artistic performances, painting and drawing exhibition, production of feature film “Samaksham”, and cultural programmes from 6.30pm onwards were also organized during these days. The exhibition was organized from 11am to 8pm. Department of Agriculture, CIFT,ATMA, Live Stock Department, Agricultural Societies etc participated and put up their stalls. KUFOS also set up a stall and displayed various models of fishing craft, gears, cage culture unit, visual aids etc. In addition to distributing brochures and leaflets on teaching, research and extension activities of the University to the delegates and the public visiting the stall, a video film on the same was also displayed.

4.Exhibitions Navakeralam 18 on 24/5/2018 at Asramam Maidan, Kollam

As part of the 2nd Anniversary celebrations of Govt of Kerala KUFOS organized a one - day programme at Asramam Maidanam, Kollam on 24/5/2018. Smt.J Mercikuttyamma, the honorable Minister for Fisheries, Port and Cashew nuts, Govt. of Kerala inaugurated the programme. Prof.(Dr.)A Ramachandran, the hon'ble Vice Chancellor, KUFOS presided over the function. Seminar on various topics as Educational, Employment and Entrepreneurship- opportunities-KUFOS , Karshika seminar, Seminar on Fish farming etc. were organized on that day for the benefit of the farmers, students and the public. Dr.M.S Raju, Dr.Daisy.C.Kappen, Dr.C D Suriyakala, Dr.S Sureshkumar, and Dr.S M Raffi were the members of core team for the successful conduct of the programme and engaged technical sessions on various topics in the seminar. The programme provided opportunities for the students to interact with the core team so as to know the various courses offered by the University. Similarly, the Karshika seminar organized gave an idea about the innovative farming techniques like cage culture and pen culture which are recently gaining more importance as an important means of increasing fish production and thereby the income of the farmers without much capital investment.



5.BRAQCON 2019 from 22/1/2019 to 25/1/2019 (4 days) at Chennai

BRAQCON 2019 was an international conference on Brackish Water Aquaculture, which provided unique platform for people who were involved in Brackish Water Aquaculture and fisheries nationally and internationally. The event was organized by the Society of Coastal Aquaculture and Fisheries (SCAF) in association with ICAR-Central Institute of Brackish water Aquaculture (ICAR-CIBA) at CIBA campus Chennai, Tamilnadu from 22nd to 25th January 2019. Aquaculture famers conclave, Aquaculture startup meeting, Paper presentations, Poster Presentations, exhibition etc. were conducted as part of the

conference. Technical Sessions on Aquaculture genetics and biotechnology, Socio-economic and livelihood issues of fisheries and aquaculture, Aquatic animal health, Aquatic environment and climate change, Fish and shellfish nutrition, Reproduction and larviculture, Aquaculture production systems, Brackish water and estuarine biodiversity and conservation, brackish water ecosystem were also arranged. The function was inaugurated by Prof. MS Swaminathan, the doyen of Indian agricultural research and education. The chief guest of the programme Thiru D Jayakumar (Minister for Fisheries Tamilnadu) released the Diagnostic Kits, Publications, and Mobile app - CIBA shrimp app .The hon'ble minister also inaugurated the aquaculture expo and seafood court. Around 30 innovative farmers from all coastal States and Haryana presented their innovative approaches and success stories in brackish water aquaculture. Kerala University of Fisheries and Ocean Studies(KUFOS) also participated 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 was displayed in the stall. The exhibition was scheduled from 9am to 8pm. Brochures and leaflets on various activities of KUFOS in the field of teaching, research, and extension including the technologies developed at KUFOS were also distributed to the public and dignitaries. The total participation of the programme was about 1,200 including 950 aqua farmers representing all the coastal States.



6. International conference on Benthos & Marine Expo-Exhibition from 6/3/2019 to 8/3/2019 (3days) at CUSAT,Kochi.

International conference on Benthos & Marine Expo (ICB 19) was conducted from March 4th to 6th 2019 at Cochin University Of Science And Technology (CUSAT). The event was organized by the Department of Marine Biology, Microbiology &

Biochemistry, School of Marine Sciences. UGC and Zoological Survey of India were the co-organizers of the event. The event was organized as part of 80th -year celebration of School of Marine Sciences. Kerala University of Fisheries And Ocean Studies (KUFOS) also participated in the expo. The formal function was inaugurated by Dr. M Rajeevan (Secretary, Ministry of Earth Science, Govt. of India). Prof.(Dr.) Rajan Gurukkal PM was the guest of honor. The conference deliberated on the need for better management of decapods fishery resources and recommended further studies on the physical, geomorphological, and environmental habitats which influence the benthic ecosystem in the Indian Ocean. A stall of size 3m x 3m was allotted to KUFOS. A video film on the activities of the University was displayed in the stall. The exhibition was scheduled from 9 am to 5pm. Brochures and leaflets showing the activities and achievements of KUFOS in the field of teaching, research, and extension were distributed to the public. Besides these leaflets on various technologies developed and standardized at KUFOS such as cage culture of pearlspot, seabass, giant trevalley etc. were also distributed to them as part of the transfer of technology programme



VI. 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 centre 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. Inlandwater cage culture training including hiring of boat

Training and awareness programmes on various aquaculture technologies are generally given in class rooms which do not always lead to the realization of expected outcomes in terms of technology adoption and production efficiency. The facilities installed by the current project will act as “on the field training amenities” for the local people of Southern, Central and Northern Kerala so that the entire State’s jurisdiction can be covered. These three units will act as facilitation points for further expanding the cage culture throughout the Kerala with the active support of Department of Fisheries and other research organizations.

Cage culture is considered as one of the most dependable protein based food production systems for the future. The current project envisages the establishment of three cage culture systems for fish production and giving hands on training to the potential stakeholders of three geographical zones of Kerala viz. Southern Kerala, Central Kerala and Northern Kerala for further expanding the concept. The objectives are:

- To promote the concept of cage culture among the “unreached people” with underutilized resources.
- To set up “on the field training facilities” for cage culture in three zones of Kerala.
- To give hands on trainings to the needy stakeholders for further expanding the

adoption of this technology towards employment generation, resource utilization, livelihood enhancement and food security.

One Senior Research Fellow and two Field Assistants joined the project and steps are being taken to establish two cage culture units, one at Payyannur and the other 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 centre 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, brackishwater 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, 2897 people visited the Public Aquarium and Museum and created a revenue of Rs. 29060/- (Twenty nine thousand and sixty only) during the year 2018-19.

Students from Choice Public School visiting the Public Aquarium and Museum



In addition to these, 782 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 conduct their practical classes for the graduate students by making use of these facilities.

Students from the following schools and colleges visited the Public Aquarium and Museum

1. Choice School, Thripunithura
2. Bhavans Vidyamandir- Eroor,Kakkandau,Elamakkara, Kadavanthra and Thrikkakara (Five schools)
3. Sri Sri Ravisankar VidyaMandir,Cheppanam.
4. Hira Public school, Cheppanam.
5. Kids world, Maradu
6. Euro kids, Maradu
7. Sam Kids Kakkanadu,Maradu, Mamamngalam and Aluva
8. Kidzee, Kadavanthra
9. Amal Public school, Vazhakkulam
10. Peace International School, Paravur
11. Shemi Public School, Thevara
12. Gregorian Public School, Maradu
13. St. Stephen College, Pathanapuram
14. Sydney Montessory School, Maradu
15. Nirmalagiri College, Kannur
16. Fisheries College, Mangalore
17. Fisheris College Muthukur, Andhra Pradesh
18. Fisheries College, Ratnagiri
19. Polytechnic college, Ratnagiri
20. Sir Syed college, Thalipparambu, Kannur
21. Sree Ganesh College of Arts and Science, Salem and
22. College of Fisheries, Punjab

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 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 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 centre

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 for 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. Equipments 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 womenfolk and students on various aspects viz. techniques of preservation, preparation of value added products, handling of processing and laboratory equipments, quality evaluation methods, sanitation and marketing practices etc. The following training programmes were organized as part of the project.

1. One day training programme on “Hygienic Preparation of Pickled Products” on 27th April 2018.

Twenty two volunteers from around Ernakulam participated in the training programme. The function was formally inaugurated by Prof. Dr. M S Raju, Dean, Faculty of Fisheries and Dr. Daisy C Kappen, Director of Extension presided over the function. Principal investigator, Dr. Abhilash Sasidharan imparted hands on training on production of various pickles such as lemon pickle, lemon and dates pickle, prawn pickle and fish pickle. Assessment of quality parameters were also demonstrated during the session. After this, there was a session handled by T R Ananthanarayanan, Managing Director, Foodastha on “Quality and Quality changes in fresh fish”. Certificates were distributed to the participants at the end of the programme.

Formal inaugural function



Introductory session



Hands on Training session

2.Two -day programme “Production Marketing added from 10th and 11th 2018



training on and of value products seafood” on October

A two -day training programme was organized at KUFOS Regional Centre, Payyannur on 10th and 11th October 2018. The programme was conducted as part of the inauguration of the Regional Centre, Payyanur, focusing on women empowerment. Fifteen delegates around Payyannur took part in the training programme. Hands – on-training on fish processing, preparation of various types of value - added fishery products, such as, fish fillet, steak, dice, butterfly, fish fingers, fish cutlet, butterfly shrimp, battered and breaded shrimp and various types of pickled products, such as, clams, prawns, lemon dates etc. were imparted to the participants.

The honourable Minister of Fisheries, Govt. of Kerala Smt.J Mercikuttyamma

having a glimpse of various value - added products of Seafood



Participants



3.Two- day training programme on “Production and Marketing of value added products from seafood” on 13th and 14th December 2018

A two day training programme was conducted at KUFOS Regional Centre, Payyannur on 13th and 14th December 2018. In all, eight delegates participated in the training programme. Hands on training was imparted in fish processing, preparation of various types of fish cuts such as fish fillet, steak, dice, butterfly and production of fish fingers, fish cutlet, butterfly shrimp, battered and breaded shrimp and various pickled products such as, clams, prawns, lemon dates etc.

Introductory session



Delegates preparing various value added products



4. One- day training programme on “Production and Marketing of value added products from seafood” on 26th January 2019

The training programme was formally inaugurated by Dr M K Sajeewan, Head of the Department of Fish Processing Technology and presided over by Dr. Daisy C Kappen, Director of Extension i/c at KUFOS seminar hall. It was followed by a lecture session on value- addition of seafood by Dr. Abhilash Sasidharan, PI of the project. In all 30 members from Kizhakkambalam Kudumbasree unit attended the training. Hands - on - training on production of fish pickle, battered and breaded products and fish cutlet were imparted to the delegates.

Participants



Dr.Abhilash Sasidharan, PI handling a session on value - addition of sea foods



Value added products prepared- Tuna pickle, Lemon pickle, Lemon dates pickle, Clam pickle, Shrimp pickle.



Value added products prepared-Fish Finger, Coated butterfly shrimp, coated

prawns, Fish cutlet



In addition to conducting the above training programmes, the recipe for preparation of various value- added seafood products was standardized and a booklet on ‘preparation of various value- added products from seafood’ was also published.

XIII.The Pandit Karuppan Chair

a)Centre for survey and appraisal of socio- economic status and livelihood security of fisherfolk, Kerala.

Kerala occupies second position in the marine fish production in the country. As per the census 2011, the fisher folk population in Kerala is 10.02 lakhs covering 7.71 lakhs in marine and 2.31 lakhs in inland sector. The fisheries sector of the State contributes about 9 per cent of the GSDP from the agriculture sector which shows the significance of the sector to the State’s economy. The total fishermen population in Alappuzha District was 1.68 lakh which is the highest fishermen populated District in Kerala followed by Thiruvananthapuram (1.65 lakh) and Ernakulam (1.33 lakh). The Gross State Domestic Product of the State increased by about 69 per cent during the period from 2005-06 to 2012-13 and the share of fisheries sector in the State’s Domestic Product declined from 1.3 to 0.82 per cent in the same period (Economic Review, 2012). During 2015-16, 5.17 lakh tonnes of marine fish were landed in Kerala. The share of fisheries sector in the Gross State Value Added (GSVA) declined from 1.12 percent in 2011-12 to 1.04 percent in 2015-16. The share of Primary Sector in GSVA declined from 15.20 percent in 2011-12 to 11.58 percent in 2015-16 (Economic Review, 2016).

The State of Kerala is implementing a number of developmental and welfare programmes for the overall development of the Fisheries sector since its inception. However, the sector still remains backward and the fishermen community is marginalized. A concurrent understanding about the demographic, social and economic status of the fisherfolk will be extremely helpful for the inclusive and planned development of the fisheries sector

and for ensuring the welfare of the fisherfolk. Hence, the present project has been undertaken with the following objectives:

Objectives of the study

- ❖ To assess the Socio -economic condition of fisherfolk.
 - ❖ To collect details of their demographic features.
 - ❖ To understand their occupational status.
 - ❖ To understand the details on landed property, housing pattern and other assets.
 - ❖ To assess the details of ownership on fishing equipments and other facilities.
 - ❖ To assess the details of earnings, household consumption, and indebtedness/savings.
 - ❖ To delineate the income and expenditure pattern of the fisherfolk households
 - ❖ To understand the fishing effort and the catch composition
 - ❖ To understand the infrastructural facilities available for fisherfolk.
 - ❖ To explore the details of fish catch.
 - ❖ To study about participation of youngsters in fishing.
- To suggest measures to solve problems of the sector

Materials and methods

The data required for the study were collected from primary and secondary sources. For the collection of primary data, Stratified Random Sampling design was adopted. The districts formed the strata. Villages from each stratum were selected at random and the households in the selected villages were chosen by adopting simple random sampling technique. Thus, of the 222 marine fishing villages 7 districts were selected and 1290 households were surveyed.

Coverage of the study

- Field work was conducted in 1290 households from 43 fishing villages from the following Districts:

Sl.No	Name of the District	Name of the Villages	No of households
1	Alappuzha	1. Omanappuzha	30
		2. Pollathai	30
		3. Thanneermukkam	27
		4. Alappuzha beach	30
		5. Thumbli	30
		6. Muhamma	30
		7. Punnapra	30
		8. Ottamasseri	30

		9. Arthungal	30
		10. Pallana	30
		11. Cherthala	30
		12. Purakkadu	30
		13. Aroor	30
		14. Pathiyankkara	30
2	Thiruvananthapuram	1. Poovar	30
		2. Adimalathura	30
		3. Vizhnjam	30
		4. Pulluvilla	30
3	Kottayam	1. Kozhikattu	31
		2. Pollasserri	30
4	Kollam	3. Parayakabavu	30
		4. Eravipuram	30
		5. Thankkasserri	30
		6. Neendakara	30
		7. Alappad	30
		8. Mayyanaduthanni	32
		9. Azhhekal	30
		10. Mukkad	30
5	Thrissur	1. Valappad	30
		2. Balangad	30
		3. Chavakkad	30
		4. Perinjanam	30
		5. Koolimuttam	30
		6. Vadanapilly	30
		7. Azheekode	30
		8. Edavilangu	30
		9. Nattika	30
6	Malappuram	1. Tannur	30
		2. Kadalundi	30
		3. Koramankadappuram	30
		4. Purathur	30

7	Kozhikode	5. Cheriyanankkad	30
		6. Kooriyad	30

Period of study : The field survey was conducted during April 2016- March 2017



Summary of Findings

The data required for the study were collected from primary and secondary sources. For the study, primary data were collected from the active fishermen households (HHs) in the selected marine and inland fishing villages using a pre-tested schedule and conducting personal interviews. Information about their demographic profile, housing conditions, occupational status, income, consumption pattern, indebtedness, savings, details of fish catch, infrastructure facilities, etc., were collected and analysed.

The profile of fisherfolk according to social group indicated that, 75.50% of the fisherfolk belongs to Other Backward Communities (OBC), while 24.50% of fisherfolk belongs to Scheduled Caste and Scheduled Tribe. The profile of the fisherfolk HHs showed that 62.64 % of them belonging to the group BPL (Below Poverty Line) and 37.36% were APL (Above Poverty Line) families. Analysis of age-wise distribution of population indicated that, majority of the fisherfolk (i.e., 71.44%) belongs to the age group between (16-60) years, 13.80% above 60 years, 14.76% falls in the age group below 16 years and the profile indicated that the population of the 1290 households was 5351 numbers and the average

number of people in a family was 4. The males constituted 53.37% and females 46.63%. The sex ratio was estimated to be 0.876. The details about the level of education attained by the fisherfolk population were also tabulated and analysed. It was found that majority of them educated only up to primary levels (48.89 %), followed by secondary (37.42 %), graduates (10.50 %), professionals (1.30%) and the illiterates (0.81%) and so on. The religion-wise categorization showed that 48.99% were Hindus, 27.44% were Christian families and the remaining 23.57% were Muslims. The housing pattern showed that majority of the fisher folk dwell in thatched houses (38.47%) against 29.88 % in tiled, 18.24 % in huts and the rest 13.41% in concrete houses. Analysis showed that 41.52% of the households possess house with tile flooring, 24.42% mud flooring and 16.67% live in houses with cement flooring. Analysis of ownership on landed property showed that 83.26 percent of them possess own land and 16.74 percent have no landed property. Information on ownership of fishing implements indicated that 35.85% of them have Gillnet, 24.68% cast net and 21.90% pursine gear. The information regarding occupational profile showed that out of the total population among the employed, fishing was the main avocation of 45.34 % of head of households, followed by fish vending (2.08 %) and, peeling (1.98%) and 23.23% of respondents are involved in private jobs. Very few people were employed in the project to *Thozhilurappu*, fish drying and other jobs. 24.40% them were students and 2.10% pensioners. Out of the total households, 99.46 % were traditional fishermen and 0.54% of them belonged to acquired fishermen category. The details about the income status of fishermen families revealed that majority of them (51.86 %) earn income in the range of above Rs.10000/month, 29.84 % of them have income in the range of Rs.5001-10000, 15.35 % in the range of Rs. 1501-5000/-. The per capita income of fisherfolk family was found to be Rs.36, 784/-. The study revealed that 40.78 % were indebted. Average workdays for fishing are estimated as 4.3 days per week, which ranged between 2 to 7 days and production/catchment of the fish is highly volatile with seasons.

Annual consumption pattern of fisherfolk households (price wise) revealed that average expenditure on rice and wheat together was found to be Rs. 7201.44, expenditure on fish was Rs. 5815.71/-, while for meat it was Rs.6123.89/- and for tuber it was Rs.2539.85/-. Out of 1290 households examined, the average amount spent for clothes was Rs. 3574.49/-. An average expenditure of Rs. 6986.88/- was incurred for education and Rs.1737.45/- for housing.

The opinion of the fishermen also revealed that the use of mechanized fishing vessels practicing destructive fishing and those who catch even fry and fingerlings cause depletion of

fisheries resources. The traditional fishermen also opined that they did not get sufficient government supports like grants, subsidies for fishing implements, rations, kerosene, etc., and whatever benefits are extended have not fully reached the target group. They also suggested that the fishing sector can be improved by using methods like sea-ranching and following responsible fishing practices. The study also indicated that owing to dwindling and uncertain income from fishing, the youngsters are reluctant to undertake fishing as an occupation and naturally they go for other occupations.

Based on the findings of the study measures for the improvement of the sector are also suggested.

b)Chair for policy studies on livelihood security and sustainable development of fisherfolk

A number of Central and State Government agencies are functioning in Kerala aimed at the development of the fisheries sector. At the same time, the contributions of the private and cooperative sectors are also decisive. Even after the implementation of various projects and programmes with the Central Government and State funding, majority of the fisherfolk continue to lead a miserable life. Improvement is possible in their livelihood through appropriate interventions by effective planning, implementation, skill up-gradation, training, monitoring and evaluation of programmes aimed at the integrated development of the stakeholders of the sector. The project also aims to facilitate comprehensive research and documentation for formulation of appropriate management programmes and suggest policy measures for the sustainable development of the fisheries and allied sectors of the State. Further, a systematic and reliable concurrent data analysis related to the socio-economic and livelihood aspects of the fisher folk and allied sectors is scanty at present and studies in this direction can provide reliable and accurate information for planners, policy makers and administrators. The activities consist of conducting field studies, collecting primary and secondary data of traditional fisherfolk in the maritime and inland Districts of Kerala State.

XIV.Centre for Indigenous knowledge of Traditional fisherfolk

The various conventional and customary fish production practices using traditional knowledge and skills need to be recorded and documented for their conservation and potential future utilization. Collection, validation, documentation and appraisal of such practices will be of great use for planning the sustainable use of fisheries resources. Besides, a balance blending of the traditional skills and knowledge with modern science and technology along with professional management will help to

address many of the issues prevailing in the fisheries sector. The project has the following objectives:

- i. Developing a nodal centre at KUFOS for aboriginal life of coastal community in KUFOS
- ii. To explore the science of traditional knowledge
- iii. Development of traditional knowledge digital library
- iv. Capacity building for sustainable management of coastal resources linking indigenous knowledge to available scientific knowledge.

The activities consist of undertaking field studies and collecting data from traditional fisherfolk both from maritime and inland Districts of Kerala, set up digital library, photo gallery, art gallery, museum and exhibition materials, scientific validation and documentation of traditional knowledge, empowerment of traditional fisherfolk through training and skill development and suggesting measures for appropriate policy measures for conservation and protection of traditional knowledge. As part of the project information on indigenous technical knowledge and dying wisdom pertaining to various aspects having impact on fisheries were unearthed, conducted traditional fisherfolk meet, awareness campaign, exhibitions, indigenous technical knowledge on the medicinal properties of some aquatic organisms including fishes and their application to cure certain chronic diseases were retrieved. Scientific papers were presented in various seminars/conferences.

Papers presented in seminar / conference:

1. Empowering and capacity building as an imperative to ensure livelihood and socio - cultural advancement of traditional fisherfolk of Kerala. Presented in World Ocean Science Congress, WOSC/TS-12/HRD/OP/2 pp 264-265 February, 2015.
2. Indigenous technical knowledge as a tool for the progress of artisanal fisheries in Kerala. Presented in World Ocean Science Congress, WOSC/TS-2/HT/OP/07/p38, February, 2015.
3. Eco-tourism potential of Vembanad Kol : A common heritage wetland system, Kerala, India. Presented in World Ocean Science Congress, WOSC/TS-8/ES/OP25/p202, February 2015.
4. Made presentation on indigenous technical knowledge in fisheries during the seminar organized by FIRMA, Trivandrum, at Ashir Bhavan, Ernakulam on 27.12.2014.

5. Participated as a faculty for information sharing and chaired the panel discussion on sustainable aquaculture, under the auspices of Fish Farmers Development Agency, Ernakulum on 13.03.2015.

Popular Articles :

1. The significance of Chinese dip net in blackwater fishing (കായൽ മത്സ്യ ബന്ധനത്തിൽ ചീന വലയുടെ സവിശേഷതകളേറെ) Desabhimani, Kilivathil dated 17.01.2014.
2. How is sustainable fisheries development? (സുസ്ഥിര മത്സ്യ വികസനം എങ്ങനെ?) Janapatham, July 2014, pp 20-22. Book 3, volume 5.
3. Azha Kadal Matsya Nayam – Poraymakal Thiruthalukal (ആഴ കടൽ മത്സ്യ നയം - പോരായ്മകൾ തിരുത്തലുകൾ) Sasthragathi, December,2014, pp 37-40.
4. Malthsya Thozhilalikkku Avaganana (മത്സ്യ തൊഴിലാളികൾക്ക് അവഗണന) Malayala Manorama Daily, 15 January, 2015,Edit page.
5. Jala Avasa Vyavastha Neridunna Paristhithika Velluvilikalum Parihara Margangalum (ജല ആവാസ വ്യവസ്ഥ നേരിടുന്ന പാരിസ്ഥതിക വെല്ലുവിളികളും പരിഹാര മാർഗ്ഗങ്ങളും) 4th International congress on Kerala studies, AKG Studies Centre, Thiruvananthapuram, publication titled Coastal Fisheries Development , Sustainability and Equity, pp 130-132, February 17,2015.

3.Other Extension activities

I.Extension Education Council Meeting

The second Extension Educational Council meeting was held on 10/12/2018 at the conference hall, KUFOS.

The following members attended the meeting:

- 1.Prof.Dr.A.Ramachandran, the honorable Vice Chancellor
- 2.Dr.V.M.Victor George, Registrar, KUFOS
- 3.Dr.Linoy Libini C., Asst.Professor & Head, FS Puthuveypu
- 4.Dr.K.S Purushan, Rtd. Dean
- 5.Rev.Fr.Xavier Kudiamssery, Director,ADS, Alappuzha
- 6.T.V.Sankar, Director of Research,KUFOS
- 7.Sri.Joby George,Finance Officer, KUFOS
- 8.Sri.M.S.Saju, Joint Director of Fisheries

9.Dr.Daisy.C.Kappen, DE i/c

Extension Education Council Meeting on 10/12/2018



The honourable Vice Chancellor, KUFOS Dr.A Ramachandran chaired the meeting and invited DE i/c to brief about the purpose of the meeting and the following decisions were taken

- 1.Approved the minutes of the Extension Education Council meeting held on 11/7/2017.
- 2.Extension Council directed DE i/c to prepare a syllabus for starting a certificate course in life saving by using modern techniques for the youngsters in the coastal area for presenting the same in the Academic Council.
- 3.Extension Council directed that RAWE programme of the BFSc programme should be restructured as per the fifth Deans Committee Report with quantitative assessment, field exposure and it should be linked with CMFRI,CIFNET etc.
- 4.As part of the Village adoption programme profitability study of the various technologies already promoted by KUFOs may be undertaken.
- 5.As part of the RMP Canal Cage Culture, full recovery of the cages may be done and it may be authorized to registered societies. Head of the FS Puthuveypu is authorized to go ahead with the task.
- 6.Extension Council directed Finance Officer to collect the details of fund utilization

and income generated from three PIs of the plan project Earn While You Learn programme.(EWYL)

7.Extension Council assessed the progress of all extension plan projects and its fund utilization under DE i/c

II.Agricultural Education Day-Open Day on December 3rd 2018

The Indian Council of Agricultural Research has directed to observe the 3rd December of every year as Agricultural Education Day which was the birth day of the first Indian Union agriculture minister and the first President of Independent India, Bharat Ratna, Dr. Rajendra Prasad. By this initiative, the ICAR aims to develop interest in agriculture and allied sciences among the school and college students and to choose 'agriculture' as their professional & research career or engage themselves in farming as Agri-Entrepreneurs. Kerala University of Fisheries and Ocean Studies also celebrated Agricultural Education Day by Conducting an “Open Day” in a befitting manner. The programme was organized from 9am to 5pm. Experts from KUFOS conducted demonstrations and practical sessions for the participants in innovative aqua culture techniques like aquaponics ,GIFT Tilapia culture, and cage culture. For creating awareness on the need to protect the mangroves, a model of mangrove ecosystem with different mangroves were arranged. Participants also witnessed the facilities available in the university such as Aquarium, Aquatic Biodiversity Museum, Fish Farms, Aqua culture Lab, Fish Processing Lab, Fishing craft and Gear Technology, Hatcheries and Library. To clear up the doubts of the farmers in various aspects of aquaculture viz. stocking, feeding, disease control, management of ponds etc. an Aqua clinic was organized .For marketing the fish and form providing entertainment to the people visiting the University , Pole and Line Fishing and cast netting were arranged. Altogether, 584 people, including the teachers and students from various schools, visited the University on that day. For the smooth conduct of the programme 17 Naval NCC students were deputed as volunteers for doing various duties. Refreshments were provided to the staff and students engaged in the stall duty.

Glimpses of the Open Day organized on 03/12/2018 as part of the celebration of Agricultural Education Day





III.Kuttanad Visit –survey on 15/12/2018

The second Extension Education Council meeting held on 10/12/2018 decided to adopt the upper Kuttanad, one of the flood affected area in the Alapuzha District during August, 2018. The team visited Pius X, Kunnummel Pally etc. at Upper Kuttanad, and interacted with the farmers to know the impact of flood in these areas, analysed the problems of the farmers and decided to formulate special package for including in the forthcoming Plan proposal.

Visit at Upper Kuttanad on 15/12/2019



IV. Web telecast of Prime Ministers Pradhan Manthri Kisan Samman Nidhi on 24/02/2019

All ICAR institutes were directed to telecast/webcast the inaugural programme of the launching of the Pradhan Manthri Kisan Samman Nidhi by the honourable Prime Minister of India on 24/2/2019. KUFOS made excellent the arrangements for viewing the programme. Besides farmers, public representatives and officers of the Govt. Departments leaders and officers from Kumbalam Panchayath, Maradu Municipality and Krishibhavan etc. were invited to witness the programme.



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 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 programmes conducted by the Directorate of Extension can be considered as the reflections of the high standard and commendable performance of the department.

CAGE AQUACULTURE - BENEFICIARIES



JOY K M KAITHARAM N. PARAVUR



JOMON JOY KAITHARAM N. PARAVUR



SUDHIN K S THATHAPPILLY, SANEESH T S KOTTUVALLY MANNAM



LIJU CHANDRAN VARAPUZHA



GOKUL CHENDAMANGALAM



SHAIJAN CHENDAMANGALAM



K B DINESAN CHENDAMANGALAM



THOMAS P J GOTHURUTH



PRATHAPAN K K AROOKUTTY



Anjali Asokan, Arookutty



Anumol Arookutty



Umeshkumar Arookutty



kiran Raj Arookutty



Bijith A M , Kottuvally



Rajesh A K, Kottuvally



Shymol K V, kottuvally



Jilson P D, Kottuvally



Jayachandran P S, Puthenvelikkara

Gopi P P, Poyya



Thilakan P P , Poyya

Nasim E K, Methala



Sani K M, Cheppanam

PEN CULTURE - BENEFICIARIES



Sl no	Place	Name of the Beneficiary	Address	Phone
1	Kottuvally	Saneesh T S	Thevaruparambil , Kottuvally,	9544501264

List of beneficiaries - Cage Aquaculture

			kaitharam,N.Pa ravoor	
		Mohanan D M	Devassampara mbil , Kottuvally, Kaitharam, N.Paravoor	9744111918
		Srijesh M S	Mattummal house, , Kottuvally, Kaitharam, N.Paravoor	8590445491
		Siju	Alingal Parambu, , Kottuvally, Kaitharam, N.Paravoor	9633587144
2	Thathapilly	Sudhin K S	Karadiparambil , Thathapilly,	9388476883
		Satheeshan K K	Kambani parambu, Thathapilly	9562441617
		Sudhi M S	Muppathu parayil, Thathapilly	9947814037
		Sajith Kumar V N	Valiya Parambil, Thathapilly	9961299728
3	Kaitharam	Jomon Joy	Kochikkatt, Kaitharam, N.Paravoor	9971114719
		Akhil Kannan		9746195479
		Tony Johny		960598500
4	Kaitharam	Joy K M	Kochikatt,	9061845980

	m		Kaitharam, N.paravoor	
		Rosy Joy	Kochikatt, Kaitharam, N.paravoor	9061500621
		Merin Jomon	Kochikatt, Kaitharam, N.paravoor	9061500621
5	Arookutt y	Anjali Asokan,	Puthanveedu, Nettoor P.O, Maradu	8137025075
6	Arookutt y	Umeshkumar K V	Kochu kannamparambi l, Arookutty, Cherthala	9847263330
7	Arookutt y	Anumol K V	Kochu kannamparambi l, Arookutty, Cherthala	9496636094
8	Arookutt y	Kiranraj K D	Kandathi house, Aroor P.O, Cherthala	9633179094
9	Kottuval ly	Bijith A M	Alingal parambu, Kottuvally, kaitharam	8590282383
10	Kottuval ly	Rajesh A K	Aramuri parambu,Kottu vally, Kaithram	9744904645
11	Kottuval ly	Shymol K V	Puthanveetil House, Kottuvally, Kaithram	8592935576
12	Kottuval	Jilson P D	Puthanveetil	9745041422

	ly		House, Kottuvally, Kaithram	
13	Puthenvelikkara	Jayachandran P S	Plakkaparambil, Thiruthoor, Puthenvelikkara	9048201954
14	Poyya	Gopi P P	Pulikka parambil, Poyya	9656116431
15	Poyya	Thilakan P P	Pulikka parambil, Poyya	9446800173
16	Methala	Nasim E K	Eramangalath House, Kandamkulam, Methala	7034491740
17	Cheppanam	Sani K M	Kannamthara Veedu, Pananagd, Cheppanam	9746277471
18	Arookutty	Prathapan K K	Kayalparambu, Nadhuvath Nagar, Arookutty	9946740291
		Maheshwari	Kayalparambu, Nadhuvath Nagar, Arookutty	8714464151
		Rajamma	Brahma, Nadhuvath Nagar,	

19	Chenda mangala m	Dineshan K B	Arookutty Kankisheri, Kochangadi,Ch endamangalam	9388803226
		Drishya	Kannamkattil, Chendamangala m	9747803724
		Ratheesh	Kannamkattil, Chendamangala m	9495992586
20	Chenda mnagala m	Gokul K G	Kavungaparam bil, Palathuruth, Chendamnagala m	9995110819
		Arish	Manappattuthar a, Palathuruth, Chendamnagal m	7034783569
		Raju	Punjayil, , Palathuruth, Chendamnagal m	8426467050
21		Shyjon K J	Kannachengatt u, , Palathuruth, Chendamnagal m	9995581395
		Gopi	Kavunga Parambu, , palathuruth, Chendamnagal m	7561837790
		Baby	Vatteparambu, , palathuruth,	9539192986

			Chendamagal m	
22	Gothurut h	Thomas P J	Pulikkathara, Gothuruth	9349320250
		Antony PJ	Pulikkathara, Gothuruth	9544113889
23	Varapuz ha	Liju Chandran	ChiramadaPura yidam, Thevarkadu, Va rapuzha	9847410241
		C R Balan	ChiramadaPura yidam, Thevarkadu, Va rapuzha	8893575603
		C R Chandran	ChiramadaPura yidam, Thevarkadu, Va rapuzha	9895715183
		Vaishnav Ulakan	Maniyanadu parambil, Varap puzha,	9092336049

Annexure II

List of beneficiaries - in Pen Culture

Sl No:	Place	Name	Address	Phone
1	Chathamma	Madhu K P	Naduvilathara, Chathamma, Panangad	7736105347
		Ghee vargheese A G	Arakkal , Chathamma, Panangad	
		N Sayiram Mohandas	Naduvilathara, Chathamma, Panangad	
		Jose mon	Arakkal , Chathamma,	

		Vagheese	Panangad	
		Tenson Joseph	Arangara, Chathamma	
2	Thuruthippuram	Mary Cheeku	Olattupurath, Thuruthippuram	9400665420
3	Panangad	Roljan N A	Nannattum Veedu, Panangad	9747527886