

KERALA UNIVERSITY OF FISHERIES AND OCEAN STUDIES, (KUFOS)

PANANGAD, KOCHI

DIRECTORATE OF EXTENSION

**REPORT ON THE EXTENSION ACTIVITIES OF THE DIRECTORATE OF
EXTENSION (2023-24)**

Funded by Government of Kerala

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EXTENSION, KUFOS(2023-24)**

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Prepared by

**Directorate of Extension
Kerala University of Fisheries and Ocean Studies (KUFOS), Panangad, Kochi-
682506**

Acknowledgement

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Village adoption for enhancing the fish production and creating employment opportunities to the fish farmers and fisherfolk for Kerala
Principal Investigator- Dr. Gijo Ittoop, Assistant Professor, AAHM

Introduction

Fisheries play an important role in the economy of Kerala state having huge natural resources in fresh water brackish water and marine ecosystems which are being used for both capture and culture fisheries. There is immense scope for promoting various aquaculture activities in these waterbodies which would help to increase the fish production of the State. Diversification of aquaculture practices in the State of Kerala will help to increase the fish production besides providing employment opportunities to the fisherfolk and fish farmers. Adopting the villages and promoting diversified aquaculture and allied activities in an eco-friendly and sustainable manner will also help to bring more inland water areas under cultivation.

State Plan project “Village adoption for enhancing the fish production and creating employment opportunities to the fish farmers and fisherfolk in Kerala” is one of the major 16 plan projects under the directorate of extension offered by Kerala University of Fisheries and Ocean Studies (KUFOS) from the year 2015 onwards. This project's primary goal is to promote diverse aquaculture practices and related initiatives in an environmentally friendly and sustainable manner to increase fish production for the State, provide more employment opportunities for fish farmers and fishermen, and ensure their security of livelihood. To ensure better products for both domestic and foreign markets and to contribute to the creation of gainful employment, the project also focuses on transferring post-harvest technology to the target population by constructing small-scale units along the coastal area. While promoting these events, a focus on women's empowerment is also placed. To generate interest among the farming communities and encourage them to use the technologies, the University adopts two to three villages each year and implements activities by setting up demonstration centers on various practices in advantageous places. All these activities are being carried out with the cooperation and participation of the local bodies.

Objectives

- To conduct field level demonstration programmes so as to standardize the aquaculture technologies, make it location specific in nature
- To augment the fish production of the Kerala State by transferring technologies to more number of villages, thus providing gainful employment to the fisherfolk
- To improve the quality of life of fisherfolk

Justification - Creating awareness and transferring the various technologies in the field of aquaculture and allied activities, providing necessary support to the target group, conducting the training cum demonstration programme in the villages will help to convince the farmers about the utility of the programme and motivate them to adopt the technologies which in turn will help to increase the fish production, leading to self-sufficiency.

Project Outline

The implementation of the project, Village adoption will be carried out in suitable areas ideal for promoting aquaculture and allied enterprises. The Village/panchayath/municipal/corporation will be selected based on the following criteria,

1. Good water quality/pollution free conditions for promoting aquaculture practices
2. Genuine interest in individual or groups such as Kudumbasree units, etc.
3. Availability of raw material at a fair price for value addition.
4. Easy access to the site from KUFOS

Methodology

1. Select two or more villages with ample unpolluted and unutilized water resources.
2. Select interested and industrious beneficiaries for the programme.
3. Conduct training programmes on various aquaculture practices and fish processing.
4. Demonstrate freshwater fish/ornamental fish farming, brackish water fish farming, cage culture pen culture, etc. in suitable water bodies.
5. Demonstrate biofloc culture, aquaponics, Recirculatory aquaculture system, etc., for interested people.
6. Establish demonstration units for value addition of fish and shellfish

Report of achievements of project' Village Adoption for enhancing the fish production

Site identification for cage culture at Mathilakam block panchayath

The activities of the project was initiated by making a field visit to Mathilakam block (Thrissur district) based on the letter given by the Mathilakam block panchayath members Shri R. K. Baby and K A Hafsai showing interest in Village adoption project of KUFOS. We were accompanied by the members to visit proposed sites for cage culture in Canoli canal of Mathilakam block panchayath. The visit was concluded after meeting the block panchayath president who requested a workshop on the proposed activities such as cage culture, pen culture and biofloc culture at Mathilakam block panchayath for the interested farmers.



One day awareness programme at Mathilakam block panchayath

One day seminar was arranged on July 8, 2022 at Mathilakam block panchayath hall which was inaugurated by the Mathilakam block panchayath president Smt. Girija. The seminar was attended by 25 farmers and block panchayath members. Classes for cage/pen culture was given by Shri Saneer N and, Biofloc culture was given by Shri Arun Das of KUFOS. The attendees were taken for a field visit to successful biofloc culture and cage culture facility sponsored by KUFOS at Puthenvelikkara.

A survey was conducted by distributing questionnaire prepared for the purpose to find out the most suitable beneficiaries.





Faculties from KUFOS taking class at Mathilakam panchayath hall

Field visit to *Kaipamangalam biofloc unit*



Field visit to Puthenvelikkara cage culture



ദുരിതമൊരുക്കുന്ന പായകൾ...



കുളമായി പാതകൾക്കു വേലി
കുളമായി പാതകൾക്കു വേലി വെട്ടിയതിനെത്തുടർന്ന് ഇവിടെ ജീവനുള്ളവർക്ക് അപായം നേരിടാനുണ്ട്. ഇവിടെ ജീവനുള്ളവർക്ക് അപായം നേരിടാനുണ്ട്. ഇവിടെ ജീവനുള്ളവർക്ക് അപായം നേരിടാനുണ്ട്.



ആറമ്പാലി - അണിമുക്ക് വേലി
ആറമ്പാലി - അണിമുക്ക് വേലി വെട്ടിയതിനെത്തുടർന്ന് ഇവിടെ ജീവനുള്ളവർക്ക് അപായം നേരിടാനുണ്ട്. ഇവിടെ ജീവനുള്ളവർക്ക് അപായം നേരിടാനുണ്ട്.

കൃഷിഭവനയിൽ തെങ്ങിൻ തൈകൾ വിതരണത്തിന്

കൃഷിഭവനയിൽ തെങ്ങിൻ തൈകൾ വിതരണത്തിന് നടപടി സ്വീകരിച്ചിട്ടുണ്ട്. കൃഷിഭവനയിൽ തെങ്ങിൻ തൈകൾ വിതരണത്തിന് നടപടി സ്വീകരിച്ചിട്ടുണ്ട്.

പ്രകൃതി ദുരന്തത്തിനു ഇരയായ കുടുംബങ്ങൾക്കു 10 ലക്ഷം രൂപ അനുവദിച്ചു: മന്ത്രി
പ്രകൃതി ദുരന്തത്തിനു ഇരയായ കുടുംബങ്ങൾക്കു 10 ലക്ഷം രൂപ അനുവദിച്ചു: മന്ത്രി

അനുഭവ അർഹത കൂട്ടാതെ അധികൃതരുടെ അനുമതിയില്ല
അനുഭവ അർഹത കൂട്ടാതെ അധികൃതരുടെ അനുമതിയില്ല

മെഡൽ തകർന്നു ജലവിതരണം മുടങ്ങി

മെഡൽ തകർന്നു ജലവിതരണം മുടങ്ങി. മെഡൽ തകർന്നു ജലവിതരണം മുടങ്ങി.

സമാരംഭ സന്ദർശനം
സമാരംഭ സന്ദർശനം നടത്തിയതിനെത്തുടർന്ന്...

തണുപ്പും കൃഷിയിലേക്ക് പദ്ധതിയുമായി തുറന്നിരിക്കുക പബ്ലിക് സ്കൂൾ
തണുപ്പും കൃഷിയിലേക്ക് പദ്ധതിയുമായി തുറന്നിരിക്കുക പബ്ലിക് സ്കൂൾ

ബന്ധുകൾ വാണാവിൽ പോകാതെ സ്റ്റാൻഡിൽ ട്രിപ്പ് അവസാനിപ്പിക്കുന്ന വിഷയം കളക്ടറുടെ ചേംബറിൽ യോഗം വിളിക്കാൻ തീരുമാനം

ബന്ധുകൾ വാണാവിൽ പോകാതെ സ്റ്റാൻഡിൽ ട്രിപ്പ് അവസാനിപ്പിക്കുന്ന വിഷയം കളക്ടറുടെ ചേംബറിൽ യോഗം വിളിക്കാൻ തീരുമാനം

യോഗം ചേർക്കുക ഉന്നത വിദ്യാഭ്യാസ മന്ത്രിയുടെ സാമ്പത്തികങ്ങൾ
യോഗം ചേർക്കുക ഉന്നത വിദ്യാഭ്യാസ മന്ത്രിയുടെ സാമ്പത്തികങ്ങൾ

കളഞ്ഞുകിട്ടിയ പണമടങ്ങിയ പൊതീ പോലീസിനെ ഏൽപ്പിച്ചു വയോധികൻ
കളഞ്ഞുകിട്ടിയ പണമടങ്ങിയ പൊതീ പോലീസിനെ ഏൽപ്പിച്ചു വയോധികൻ



മുഖ്യമന്ത്രിയുടെ അദ്ധ്യക്ഷതയിൽ നടന്ന സാമ്പത്തിക ഉപസമിതിയുടെ യോഗം

മഴ: തെക്കുംകരയിൽ ഒഴുപ്പിപ്പിൾ



മഴക്കാലത്ത് മഴയിൽ അധികം വീശിയിട്ടുണ്ട്. മഴക്കാലത്ത് മഴയിൽ അധികം വീശിയിട്ടുണ്ട്.

സേക്രഡ് ഹാർട്ട് കോളേജിൽ പൂർവ്വ അധ്യാപക - വിദ്യാർത്ഥി സംഘടന വാർഷികം



സേക്രഡ് ഹാർട്ട് കോളേജിൽ പൂർവ്വ അധ്യാപക - വിദ്യാർത്ഥി സംഘടന വാർഷികം

കൊരടി മുടപ്പു ചെക്ക്ഡാരിന് ഒരുക്കോടി രൂപയുടെ ഭരണാനുമതി

കൊരടി മുടപ്പു ചെക്ക്ഡാരിന് ഒരുക്കോടി രൂപയുടെ ഭരണാനുമതി. കൊരടി മുടപ്പു ചെക്ക്ഡാരിന് ഒരുക്കോടി രൂപയുടെ ഭരണാനുമതി.

അടിപ്പത നിർമ്മാണം നീളുന്നത് ജനത്തോടുള്ള വെല്ലുവിളി: എൻജിനീയർ

അടിപ്പത നിർമ്മാണം നീളുന്നത് ജനത്തോടുള്ള വെല്ലുവിളി: എൻജിനീയർ. അടിപ്പത നിർമ്മാണം നീളുന്നത് ജനത്തോടുള്ള വെല്ലുവിളി.

അതിരടിള്ളി ടൂറിസ്റ്റ് കേന്ദ്രത്തിലേക്ക് സമാന്തരപാത ഏർപ്പെടുത്തണം

അതിരടിള്ളി ടൂറിസ്റ്റ് കേന്ദ്രത്തിലേക്ക് സമാന്തരപാത ഏർപ്പെടുത്തണം. അതിരടിള്ളി ടൂറിസ്റ്റ് കേന്ദ്രത്തിലേക്ക് സമാന്തരപാത ഏർപ്പെടുത്തണം.

One of the attendees of the seminar at Mathilakam came forward with two others and gave request for funding assistance from the project for the installation of 6 cage culture units in Anapuzha, Kodungalloor Municipality, Thrissur District, stating water quality was best in those places for sea bass culture. They brought no objection certificate from municipality and thus they were selected for funding assistance. Quotation was called for cage construction and order was given. Currently the cage construction is going on. One unit of cage includes 3 cages of 2x2 m and costs Rs. 46500/- excluding net.

Order for supply order no. and order notice no. was given. As of now four out of six cages is completed. Request has been put forth for quotation notice of Rs 85000/- for walking platform. Supply order for Seabass seed (Rs 98000/-) and Pompano seed have been given. Supply order for Etroplus is getting ready (Rs 131250/-). Thelli meat quotation notice is also getting ready (Rs 45000/-). Supply order for above fish seeds (Shrimpex) is also given (Rs 120000/-).



Construction of fish cages at Anappuzha

Visit to commercial scale vannamei biofloc culture facility at Kodungalloor

A biofloc facility at Kodungalloor was visited, to understand the feasibility of biofloc culture of vannamei at farm level. The tank was of 10 m dia with 80000 ltr capacity, where within 3 months of culture the shrimp reached a size of 25g.

Semi RAS system in Kodungalloor



Biofloc Culture of L. vannamei at KUFOS (Rs. 46500/-)

Biofloc culture of vannamei was initiated in 4 m dia biofloc tank of the AAHM department of KUFOS on July 18th in 10000 litre water, with water quality Ph-7.5, Alkalinity 98, Hardness 90, Salinity 0. The product named "AQUAMIN", was used to increase the salinity to 15 ppt. Used 35 kg of aquamin to convert 10000 ltr fresh water to 15 ppt saline water. Added 150 kg raw salt. Then we chlorinated with 200 gm bleaching powder. We fixed the aeration using aeration pumps of capacity 250w. Then after 5 days of de chlorination and aeration the water quality was again checked. Ph- 8.2, Alkalinity 220, Salinity 12.

Stocking was done 2500 nos of Vannamei seeds PL 10 stage from Sathagiri hatchery, Andhra with after acclimatization. Nutriva I stage feed was given as blind feeding @ 40 gm in 2 hour interval from 8 to 6 pm. Ammonia and pH are checked every morning. Carbon source (Sugar) is added @ 300gm of 100gm each in 2 hour interval, initially to control ammonia initially. Probiotic 'NH 4 aqua' with *Nitrosomas* and *Nitrobacter*, 10 ml each 2 times morning and evening whenever ammonia content increased. Moulting is monitored.

After five months of stocking, harvest was conducted on December 5. All the cultured shrimp was found to be healthy. No mortality was reported. The average size of shrimp was between 25-35 gm.



Adding Aquamin



Adding Raw salt





Report on the Trainings organized

- I. 3 days training programme for farmers conducted as part of the project entitled “Village Adoption for enhancing the fish production and creating Employment opportunities to the fish farmers and fisherfolk in Kerala”, jointly with the Faculty of Fisheries Science KUFOS. Twenty farmers attended training programme. The training programme started on March 3rd 2022 with the inauguration by the Hon. Vice Chancellor of KUFOS, Dr. Riji John and felicitated by Registrar Dr. Manoj Kumar, Director of Research Dr. Devika Pillai and Dean Faculty of Fisheries Dr. Rosalind George. Dr. Daisy C Kappan the Director of Extension welcomed the farmers and explained details of training programme.

The sessions included Problems and prospects of brackish water aquaculture taken by Smt Dona P Guest faculty in Extension, Principles of aquaculture taken by Smt. Shalumol Salas, guest faculty of extension, Biofloc culture taken by expert Sri M. Shaji, Retd. Joint director MPEDA, Pen and cage culture by Dr. Daisy C. Kappan, DoE, Seed production and culture of Pearl Spot by Dr. Anwar Ali Assistant Professor KUFOS, The Activities of Department of Fisheries explained by Divya T Babu, from Department, Brackish water shrimp culture by Ragesh C. G. Research Fellow, two sessions, mussel culture and feed formulation and preparation given by Dr. Bindhi S Kumar, RA ning Associate, Value added products and marketing, taken by Vishnu R Nair, Research Associate CIFT and session of fish and shrimp diseases by Dr. Safeena M. P. Assistant professor, KUFOS. Here was also a field visit wherein the trainees got familiarized with the farm and farming techniques followed in KUFOS.

II. Seed Production and Culture Techniques of Snake Heads

A four-day training programme on Seed production and culture techniques of Snake head” was organized under Village adoption Project of Directorate of Extension and Faculty of Fisheries Science, Kerala University of Fisheries and Ocean Studies, Panagad Kochi, Kerala (KUFOS) by the Principal Investigator of the project Dr. Gijo Ittoop, Assistant professor, from 18th to 21st October 2022. The programme was inaugurated by the Vice Chancellor, KUFOS, Dr. K. Riji John. In the inauguration function, the nutshell of the programme was explained by the Director of Extension, Dr. Daisy C Kappan. A training manual on new trends in aquaculture named “Malsyakrishi Noothana Sankethika Vidhyakal” published under the directorate of extension was released by the Vice Chancellor and the copies were distributed to the farmers. The main objective of the training program was to give awareness and confidence to the farmers to venture into the culture of snakeheads which has enormous potential in Kerala, because of the high demand and price of the fish in local market. 27 farmers and interested students of KUFOS were given hands on training. The seed production classes were led by Dr. Anwar Anil, Asst. Professor, Faculty of Fisheries Science. The culture techniques were explained by Arun Das, consultant and entrepreneur, Business Incubation Centre, KUFOS. On the first day of training, sessions on basic principles of aquaculture and prospects and possibilities of snakehead culture were given. Selection of snakehead brooders were demonstrated to the farmers. On the second day of training, hypophysation was demonstrated and farmers were allowed to perform injection on fish. On the same day, demonstration classes on seed production of *Etroplus suratensis*, the state fish of Kerala was taken by Dr. Binu Vargheese, in *etroplus* hatchery of KUFOS. Various culture techniques of

snakeheads such as culture in silpaulin lined ponds, earthen ponds and in unused biofloc tanks with RAS (Recirculatory Aquaculture System). Technology was explained with financial analysis by Sri. Arun Das.

On the third day, demonstration sessions on live feed culture, rearing of spawn, artificial feed preparation, weaning of fry for pelleted feed and value addition of products from snakeheads were taken. On the fourth day, awareness classes on topics such as health management, anti-microbial resistance and alternatives and fish as a nutrient rich food was taken by experts in the respective fields. Officials from State Fisheries Department gave awareness on various projects and schemes offered by the government. The farmers were taken for a site visit to understand the farm infrastructure, hatcheries and aquarium complex of KUFOS.

At the end of the training program, the farmers expressed their confidence to start the culture and seed production of snakehead. They also requested follow up training programs. The participants were given certificates by the Vice Chancellor.





III. **Advanced technologies in Aquaculture**

Two days Training program of 14/3/24 and 15/3/24 for 15 farmers. An amount of Rs. 15000/- was remitted to university as fees from farmers as per Receipt no 20 Book no 755.





Collaboration with ICAR-Central Coastal Agricultural Research Institute

The possibility of external funding by ICAR-Central Coastal Agricultural Research Institute (CCARI) is being explored as the director of CCARI has agreed to collaborate with Village Adoption project in such a way that, from the project, the technical and logistical support will be given to the farmer and

the funding will be from CCARI. CCARI is interested in setting up demonstration units of cage and pen culture for seabass and pearlspot in the Chettuva estuary to support coastal fishermen and fish farmers under the Scheduled Caste category for enhancing their income and farming practices. The letter from the director CCARI is attached herewith. In this connection made 2 visits to Chettuva for site visit and awareness to fishermen and farmers.



Awareness was given to farmers/fishermen in connection with SCSP distribution cum fishermen interface programme planned by ICAR-CCARI on 1 March, 2024 at the Venkitangu Fisheries Co-operative Society premises, Thrissur under the ICARSCSP component, Govt. of India.



Presented Paper on suitability of area Kodungallur-Azhikode for cage culture at International Fisheries congress 2024

Abhijit, V. T., Sreekanth G.B., Eldho J. Paul., Ranjit Rameshan and Gijo Ittoop*(2024) Experimental cage culture of Asian Seabass, Lates calcarifer and Pearlspot, Etroplus suratensis in a tropical estuary- Kodungallur-Azhikode In: Book of Abstracts International fisheries Congress and Expo 2024 Jan 12-14, 2024 Abstract No. T4-29

Abstract:

One of the most significant and affordable intensive fish culture techniques available today is the cage aquaculture system, where the water provisioning is given by the natural ecosystem. The cage culture system is an efficient, hassle-free, and financially viable method of fish farming even for unskilled fish farmers/fishermen. This study focuses on the experimental cage culture of *Lates calcarifer* (Asian Seabass) and *Etroplus suratensis* (Pearlspot) in Anappuzha region of the Kodungallur-Azhikode estuary, Kerala district . Six cage units were installed with each unit comprised of three cages (2 × 2 × 2 m). Four thousand seeds of Seabass (average size: 120 mm) and 4000 seeds of Pearl spot (average size: 70 -80 mm) were stocked in the cages (33nos/cubic metre for seabass and 130/ cubic metre for Pearl spot, stocked inbetween inner and outer cage). The Pearl spot was fed with pellets and seabass was given prawn meat and trash fish at the rate of 10% of body weight initially which was gradually reduced to 5% of body weight. Despite meticulous cage and fish maintenance, significant mortality occurred in the early fourth month. This coincided with the opening of bundhs near Manjaly and Kanakkankadavu, allowing polluted factory water from the Chalakkudy area to contaminate the fish habitat. The fish were tested for various diseases, but no pathogen was detected. Symptoms of oxygen depletion pointed toward water contamination. The culture now stands with a 60% survival rate for Seabass and 80% for Pearl spot with the former weighing around 800 g and the latter around 100 g. The current biomass of the stock is estimated at 2500-3000kg and 350-450 kg for seabass and pearlspot respectively. The economics has been worked out, and it was found that despite the mortality event, the culture is profitable, and the area is highly suitable for cage culture.

1. Harvest of the Seabass cum pearlspot cage culture at Anapuzha





Publishing of Hand book for farmers

Initiative is taken for publishing of the book in Malayalam for the benefit of farmers



Support to Existing Cage Culture Facilities

There are about 50 beneficiaries in Kumbalam, Pthenvelikkara, Brahmamangalam, North Paravoor, Anappuzha gramapanchayaths. Repairs were done on cage and pen culture units already established.



Monitoring of

Cages and Pens allotted in the previous financial year at Kumbalam Panchayath



Talk on Radio Kisan Divas on “Possibilities of using the existing water bodies of Chembu Gramapanachayath for better fish production” on 15th February 2023

Farm Advisory Services

Principal Investigator- Dr. Safeena M P, Associate Professor

Introduction

An increase in fish production depends upon many factors namely, the expansion of the area under aquaculture, diversification of culture technologies and cultivable fish species and a system of information transfer from the research and development centres to the farming households. The prime objective of aquaculture or fisheries extension is to persuade and help aqua farmers and fishing communities to improve socio-economic condition and livelihood through their farming practices for increased fish production and income. Though a great deal of technology development and transfer has taken place in aquaculture, a broad network of extension system to reach the clientele at large is yet to be established. Effective extension services are required to support the existing farmers and the new entrants for effectively promoting equitable and sustainable development of aquaculture that will contribute to overall rural socio-economic life. Quick and large scale motivation of fish farming communities is essential to learn and use the technologies and mobilize essential materials and technical inputs at their doorsteps.

Lack of knowledge about the improved practices in aquaculture and allied sectors is one of the major constraints in the adoption of better management practices so as to increase the fish production of the State and ensuring better quality product for export. Creating due awareness on brackish water and marine aquaculture practices among local population and students will help to adopt the improved practices in aquaculture and allied activities in a sustainable manner which will help increasing the fish production, creating more employment opportunities and ensuring nutritional and livelihood security to them.

Conducting capacity building programmes like training cum demonstration programmes, creating awareness through mass media on various aspects of aquaculture, harvest and post harvest technologies will ultimately increase their level of knowledge and skill among the farmers. Through this plan project “Farm Advisory Services” two training programmes viz. “Paduthakulathile matsyakrishi” and Vannamei and Pearl spot farming techniques”

The main objectives of the project are

- To conduct capacity building programmes with an aim to improve various information related to inputs; like feed, seed and brood stock in aquaculture and post harvest operations.
- To disseminate technology through publishing success stories, farm related news or projecting the project results in relevant scientific journals/local publications.
- To examine the possibilities of providing online services to farmers

Center for Audio Video Recording and Transfer of Technologies in Fisheries

Principal Investigator- Dr. Sethulakshmi C S, Assistant Professor

As part of the Plan Project “Center for Audio Video Recording and Transfer of Technologies”, a well-equipped Audio Video Recording Studio with all facilities both for audio and video recording started functioning during the year 2018. Currently, a Cameraman cum NLE Editor is working in this project. In addition to documenting the activities and achievements of the university in teaching, research and extension, instructional films in diversified aquaculture activities, production of value added fishery products etc are also taken up for transferring the technologies to the fish farmers and fisherfolk along the coastal area. Ten DIY videos on preparation of Value-added fishery products has already been produced. Since the lack of adequate knowledge about the various technologies in the field of fisheries sector still acts as a major constraint in the wide-spread adoption various technologies, such an approach in communicating different technologies through Audio Visual aids to the target group will definitely help in disseminating the technologies at a faster rate, leading to augmentation of production from the fisheries sector, increasing the rate of adoption of practices etc. As per the decision of the Governing Council, Directorate of Extension is outsourcing the above facilities to various institutions and started creating income for the University. An amount of Rs.64,750/- (Sixty four thousand seven hundred and fifty only) was earned during the year 2022-23 by outsourcing the studio facilities. The following activities were carried out during the year 2022-23.

Expansion of Facilities of Museum and Public Aquarium

Principal Investigator- Dr.Rajeev Raghavan, Assistant Professor

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 per cent 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, The 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 fishes 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 students 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, The public and officers from different institutions. In addition to this, Faculties of various departments of KUFOS are using this facility to engage classes to the B. F. Sc. students.

Modernization and up gradation of Instructional Field training facility **Principal Investigator- Dr. K Dinesh, Professor**

The Project on Modernization and upgradation of Instructional field training facility operating under the Department of Aquaculture with the major objective of improving and upgrading the instructional farm of the University is a prestigious project of the Directorate of Extension, KUFOS. Having been blessed with sufficient quantity of brackish and freshwater, our instructional farm has been practising the culture of freshwater fishes like Catla, Rohu, Mrigal, Common Carp, Pangasius, Tilapia, Murrel, Olive Barb etc. and shrimps like *P. vannamei* and *P. monodon* and brackishwater fishes like *Lates calcarifer* and *Etroplus suratensis*. The farming is mainly practised to give hands-on training to the students and also to generate internal revenue for the University. As part of the various courses under the Department of Aquaculture, students are regularly deployed in the instructional farm for improving and improvising their skills in seed production, nursery rearing and grow-out operations. Students are given the opportunities to do their own aquaculture entrepreneurship during the eight semester of B. F. Sc. programme. So, there is an absolute requirement of updating the farming techniques and protocols for attaining the appreciable fisheries professionalism among the students. The farm facilities are also used for Earn While You Learn programme, Post Graduate, PhD research. Through the current project, new farming strategies like Pen culture and Cage culture was taken up to demonstrate the technology to the students

and farming community. Regular training programmes are organized for the needy people in aquaculture and allied activities. Two areas with the individual plot size of 5 cents each were cleared and deepened for the installation of cage and pen. One of the major activities undertaken during the Plan period was the stocking of the installed pen in the farm premises. The species stocked is *Lates calcarifer* and grow out culture is in progress. A portion of the labour requirement of the farm was met from this fund. It is necessary to continue this project for modernizing the farm further.

MOOC

Principal Investigator- Dr. Maya Raman, Associate Professor

1.Kerala University of Fisheries and Ocean Studies (KUFOS) has **launched two MOOC courses through the SWAYAM (NPTEL) platform.**

i.Food Packaging Technology- Course coordinators: Dr. Maya Raman and Dr. Jenny Ann John

ii.Canning Technology and Value Addition of Seafood- Course coordinators: Dr. Maya Raman and Dr. Abhilash Sasidharan

Both the courses commenced on August 21, 2023. These are 8-week courses with 2 credits that may be considered for credit transfer and as Faculty Development Programme by AICTE.

The courses were translated and will be shared by the NPTEL in 2024. Teaching assistants were engaged for translation by NPTEL and they received appreciation certificates.

The course enrolment and registration details are indicated below:

i.Food Packaging Technology

•Total enrolments: 4074

•Total registrations: 981

ii. Canning Technology and Value Addition of Seafood

•Total enrolments: 1615

•Total registrations: 388

Food Packaging Technology

By Prof. Maya Raman, Prof. Jenny Ann John | KUFOS Panangad

[Go to course](#) **Learners enrolled: 4074** | **Exam registration: 981**



ABOUT THE COURSE:

Food is a highly perishable commodity and needs suitable packaging for extending the shelf life and preserving the nutritional quality. In this course, the various types of packaging materials and their properties and applications will be covered. The course will also cover the regulations and standards associated with it.

Summary

Course Status :	Completed
Course Type :	Core
Duration :	8 weeks
Category :	o Multidisciplinary
Credit Points :	2
Level :	Undergraduate/Postgraduate
Start Date :	21 Aug 2023
End Date :	13 Oct 2023
Enrollment Ends :	21 Aug 2023
Exam Registration Ends :	15 Sep 2023
Exam Date :	28 Oct 2023 IST

Note: This exam date is subjected to change based on seat availability. You can check final exam date on your hall ticket.

Canning Technology, Value Addition Of Seafood (Fish Processing)

By Prof. Abhilash Sasidharan, Prof. Maya Raman | KUFOS Panangad

[Go to course](#) **Learners enrolled: 1615** | **Exam registration: 388**



ABOUT THE COURSE:

The course will provide a comprehensive knowledge on the concepts of canning technology, types of cans, machinery, canning process and quality issues. This will also give insights on thermal process calculations. Various value added food products and its quality management will also be covered in this course.

INTENDED AUDIENCE: Students, Researchers and Industrialists

Summary


Course Status :	Completed
Course Type :	Core
Duration :	8 weeks
Category :	o Multidisciplinary
Credit Points :	2
Level :	Undergraduate/Postgraduate
Start Date :	21 Aug 2023
End Date :	13 Oct 2023
Enrollment Ends :	21 Aug 2023
Exam Registration Ends :	15 Sep 2023
Exam Date :	29 Oct 2023 IST

Note: This exam date is subjected to change based on seat availability. You can check final exam date on your hall ticket.

2. The NPTEL Soft Skill Training Programme was conducted in two batches for students.

•The 1st batch training programme was held from 22/08/23 to 27/08/23 and the 2nd batch from 14/11/23 to 20/11/23. 80 students registered for this training. The students were trained in resume building, personality development, soft skills. They also had an opportunity to participate in mock interview with esteemed NPTEL faculty.


3. The MOOC courses offered by KUFOS are recommended by NPTEL for rerun from 2024 to 2026. In 2024, MOOC courses will commence on August 19, 2024.


About Swayam | All Courses | saritha.payyappilly@gmail.com

Food Packaging Technology

By Prof. Maya Raman, Prof. Jenny Ann John | KUFOS Panangad

[Go to course](#) **Learners enrolled: 3600** | **Exam registration: 140**



ABOUT THE COURSE:
Food is a highly perishable commodity and needs suitable packaging for extending the shelf life and preserving the nutritional quality. In this course, the various types of packaging materials and their properties and applications will be covered. The course will also cover the regulations and standards associated with it.


INTENDED AUDIENCE: Students, Researchers and Industrialists

Summary

Course Status :	Upcoming
Course Type :	Core
Duration :	8 weeks
Category :	o Multidisciplinary
Credit Points :	2
Level :	Undergraduate/Postgraduate
Start Date :	19 Aug 2024
End Date :	11 Oct 2024
Enrollment Ends :	19 Aug 2024
Exam Registration Ends :	30 Aug 2024
Exam Date :	03 Nov 2024 IST

Note: This exam date is subjected to change based on seat availability. You can check final exam date on your hall ticket.


This is an AICTE approved FDP course


About Swayam | All Courses | saritha.payyappilly@gmail.com

Canning Technology, Value Addition of Seafood (Fish Processing)

By Prof. Abhilash Sasidharan, Prof. Maya Raman | KUFOS Panangad

[Go to course](#) **Learners enrolled: 1292** | **Exam registration: 50**



ABOUT THE COURSE:
The course will provide a comprehensive knowledge on the concepts of canning technology, types of cans, machinery, canning process and quality issues. This will also give insights on thermal process calculations. Various value added food products and their quality management will also be covered in this course.

INTENDED AUDIENCE: Students, Researchers and Industrialists

Summary

Course Status :	Upcoming
Course Type :	Core
Duration :	8 weeks
Category :	o Multidisciplinary
Credit Points :	2
Level :	Undergraduate/Postgraduate
Start Date :	19 Aug 2024
End Date :	11 Oct 2024
Enrollment Ends :	19 Aug 2024
Exam Registration Ends :	30 Aug 2024
Exam Date :	03 Nov 2024 IST

Note: This exam date is subjected to change based on seat availability. You can check final exam date on your hall ticket.

KARIMEEN GRAMAM

Principal Investigator- Dr.Binu Varghese, Assistant Professor

Karimeen, *Etroplus suratensis* was declared as the State Fish of Kerala in 2010. The well-known inland fishery for the same is on the verge of collapse due to environment degradation and destructive fishing practices. The enhancement of production can be achieved by conserving the natural resources and improving the aquaculture production. A viable backyard seed production and nursery rearing methodologies were developed at KUFOS. Through proper extension and technological intervention the status of Karimeen aquaculture can be revived. This can generate viable employment opportunities at various strata like seed production, nursery rearing for fingerling production, cage/pond aquaculture, value addition, and marketing. This pilot project will be implemented at Kumbalam Panchayath, which is surrounded by Vembanad Lake the historical abode of Karimeen. The fish sanctuaries will be established in a community participatory mode after proper awareness programmes.

SIGNIFICANCE:

Karimeen is yet to mark its significance in the aquaculture product basket of the state. It remains as an under performer compared to its vast potential. This scenario can be transformed by the proper technology transfer for seed production, nursery rearing and aquaculture. Once implemented this will greatly contribute to the economy of the island Panchayath of Kumbalam, where many fisher families resides. The successful demonstration and implementation of the programme may attract new entrants to the field, and technological support will be extended.

OBJECTIVES:

Technology transfer, demonstration and training

- To develop seed production centers
- To develop nursery rearing centers
- To establish Karimeen Sanctuaries
- To promote aquaculture (cage/pond/RAS) activities
- To promote Value Addition and provide Marketing support
- To create awareness on resource conservation

ANTICIPATED OUTCOME / DELIVERABLES:

- Increased seed production of Karimeen for pond and cage aquaculture
- Increased production of Karimeen
- Employment generation - seed production, aquaculture, value addition & marketing
- Conservation of the Karimeen resource at its natural hub
- Replicable Model for easy adoption elsewhere.

Progress of project implementation in 2022-23

Highlights

- Collected base line information about the Panchayat and Aquaculture activities.
- Sample surveys were conducted to assess the socio economic status and information needed for the project implementation.
- Project presented before the Panchayat attended by all the ward members and President on 20.7.2022.
- Project staff were being trained in the fish breeding, larval rearing and aquaculture.
- Streamlined the procurements needed for smooth implementation of the project.

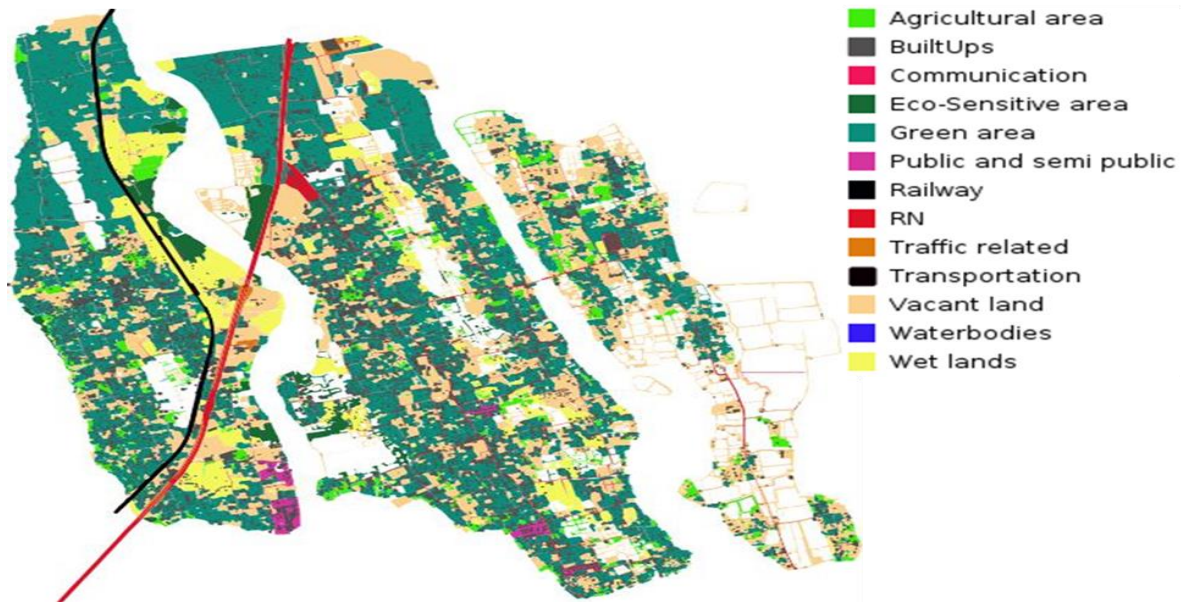
Fish markets, fisher cooperatives, Dept of Fisheries were contacted to collect data about the fishers and fish farmers in the Kumbalam Panchayath. The capture and culture data of *Etroplus suratensis* were collected from traditional fishers and fish markets. Fish farms were visited and inspected for its suitability to implement the project.

Thirty five households in Kumbalam were visited for the sample survey, and among those 48% had their main income from fishing or fish farming. It was found that 82% of the sampled household preferred fish in their meals, and majority of them prefer backwaters fishes. They were found to spend around 500 to 1000 rupees for 1 to 5 kg of fish per week. Most families said they can't afford karimeen due to the high price. Among surveyed 45% of households do not have any facilities or interest in the culture of the fish. The survey observed that majority of fishers believes that there is serious decline in fish population in Kumbalam panchayath due to water pollution and environmental changes.

The availability of Karimeen now averages around 2 to 3 kg per week for each fishers and market information gives an average monthly landings of 750 to 950 kg. Karimeen is available throughout the year, but declines during the monsoon season, wherein it declines to 450 to 500 kg per month.

Fifteen fish farms were inspected for the implementation of karimeen seed production units


Area in Sq. Km	Population	Density of Population	Wards	No of House Holds
20.79	42,852	2061.18	18	10,652






കേരള ഫിഷറീസ് സമുദ്ര പഠന സർവ്വകലാശാല, പനങ്ങാട്
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പൊതു വിവരങ്ങൾ

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മത്സ്യകൃഷി വിവരശേഖരണം

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7	ജലസ്രോതസ്സ്?	<input type="checkbox"/> കുളം <input type="checkbox"/> കിണർ <input type="checkbox"/> കായൽ <input type="checkbox"/> പൈപ്പു വെള്ളം <input type="checkbox"/> ടാങ്കർ വെള്ളം <input type="checkbox"/> കൃഷിയിടത്തിൽ <input type="checkbox"/> മഴവെള്ളം <input type="checkbox"/> കെട്ട് <input type="checkbox"/> മറ്റുള്ളവ-
8	ഏതു തരം കൃഷിയാണ് നിലവിൽ നിങ്ങൾ ചെയ്യുന്നത്?	<input type="checkbox"/> പരമ്പരാഗത ചെമ്മീൻ കെട്ട് <input type="checkbox"/> ശാസ്ത്രീയ ചെമ്മീൻ കൃഷി <input type="checkbox"/> കുളങ്ങളിലെ മത്സ്യകൃഷി <input type="checkbox"/> കുട്ടുകൃഷി <input type="checkbox"/> വളവുകൃഷി <input type="checkbox"/> ടാങ്കുകളിലെ മത്സ്യകൃഷി <input type="checkbox"/> ജലപുനഃചക്രണം കൃഷി <input type="checkbox"/> ബയോപോക്ക് <input type="checkbox"/> അക്വാപോണിക്സ് <input type="checkbox"/> കൈത്തൊടുക്കലിലെ മത്സ്യകൃഷി <input type="checkbox"/> തെങ്ങു വളർത്തൽ <input type="checkbox"/> കല്ലുമക്കായ <input type="checkbox"/> സംയോജിത മത്സ്യകൃഷി <input type="checkbox"/> അലങ്കാര മത്സ്യകൃഷി <input type="checkbox"/> കുഞ്ഞുങ്ങളെ വളർത്തിവിൽക്കൽ <input type="checkbox"/> മത്സ്യ കുഞ്ഞുങ്ങളുടെ ഉൽപാദനം <input type="checkbox"/> നേൽപ്പാടുകളിലെ മത്സ്യകൃഷി <input type="checkbox"/> മറ്റ് കൃഷി രീതികൾ-
9	തനിയെയാണോ / ഗ്രൂപ്പ് ആയിട്ടാണോ കൃഷി ചെയ്യുന്നത്	<input type="checkbox"/> തനിയെ <input type="checkbox"/> കുടുംബത്തിന്റെ സഹായത്തോടുകൂടി <input type="checkbox"/> ഗ്രൂപ്പായി
10	ഗ്രൂപ്പ് ആണെങ്കിൽ എത്ര പേരാണ് ഗ്രൂപ്പ് ആണ്	<input type="checkbox"/> 2-5 <input type="checkbox"/> 6-10 <input type="checkbox"/> 10 മുകളിൽ



. Name:Anoop Ward :12 Total area: 50cent



Name: Sethu , Ward: 18, Total Aera: 5Acre

Exhibition Unit

Principal Investigator- Dr. Jayalakshmi K J, Assistant Professor

During the period, KUFOS organized /participated in various exhibitions including International, National and state/district levels in both government and private sector. A total of eight exhibitions are in the list which gave nearly 19 days of public exposure on various activities of the University. In 2024, KUFOS and COFPAA jointly organized a three day (28th November to 30th November 2019) International Fisheries Conference and Expo IFCE 2024) at KUFOS Head quarters Kochi.

Details of Exhibition Participated_ 2023 -2024					
Sl. No.	Name of the Event	Place	Date		Duration (Days)
			From	To	
1	Turning Point -2023 Career Expo, Kannur, organised by Thaliparamaba Assembly Constituency, Kannur	Moothedath Higher Secondary School Thaliparamba, Kannur	04-05- 2023	05-05-2023	2
2	Global Fisheries Conference 2023 (GFC-2023) held on 21-22 November, 2023 at	Ahmedabad, Gujarat	21-11-2023	22-11-2023	2
3	SNGCE Expo Kadayirippu	Sree Narayana Gurukulam College of Engineering, Kadayirippu	30.11.2023		1
4	International Fisheries Conference and Expo	KUFOS, Kochi	12-01-2024	14-01-2024	3
5	Disha -2024 Career Expo Thrithala	Max plus Regency, Padinjarangadi, Thrithala.	16-01-2024	17-01-2024	2
6	Malayala Manorama Karshakasree Kaarshika Mela 2024	Malappuram, Kerala	31.01.2024	04-01-2024	5
7	MES Grand Fiesta - 2024 Marampally	MES College Marampally	22.02.2024	24.02.2024	3

8	Chief Minister's Mughamugham programme - Karshakasamvadam of Aleppey District	Camelot Convention Centre, Pathirappilly, Aleppey	02.03.2024		1
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Highlights of major events

1. KUFOS has participated in the exhibition as part of Global Fisheries Conference 2023 (GFC-2023) held on 21-22 November, 2023 at Ahmedabad, Gujarat. An exhibition stall of 3 x 3m size was set up to display the academic, research and extension activities of KUFOS. Videos highlighting the achievements of the university was played continuously during the programme along with the Messages from Hon'ble Vice Chancellor, Director of Extension, Director of Research etc. Brochures, leaflets, pamphlets of detailing the various academic and research programmes of the University were distributed to the stake holders of the conference. Food products including value added fish products developed by the various departments of the university were displayed in the exhibition stall. The posters displayed in the stall on various farming technologies developed by the KUFOS such as cage culture of *Etroplus suratensis* (pearl spot) and *Caranx ignobilis* and pen culture of *Sea bass* etc were gained more attention among the fisherfolks who visited the stall. The activities of Business Incubation Centre of KUFOS displayed as the backdrop attracted entrepreneurs as well as the students community. The discoveries especially the description of new species added to the scientific world by KUFOS highlighted during the programme. The brochures explaining the various academic programmes of KUFOS such as curriculum, syllabus, structure, course fees, admission procedure, etc were distributed to the stake holders as and when required. Apart from this, small booklets published by KUFOS regarding various subjects such as fish farming activities, hatchery rearing, aquarium maintaining, etc were displayed during the event. The value-added fishery products attracted many visitors to the exhibition stall. It includes Sea weed pasta, fish gelatine products such as Mash mellow and sugar-coated jelly, by products such as Agar Agar, Chitin, Chitosan, sharkfin rays, protein granules etc. The participation of exhibition in an International event like Global Fisheries Conference 2023 (GFC-2023) was a great opportunity to showcase the activities as

well as to emphasize the social commitment of the university in the fisheries and allied sectors of the country.

An overview of exhibition stall of KUFOS



Stake holders visiting the Exhibition stall



KUFOS team In front of the Exhibition stall



Expalning about the fishery products by the KUFOS students



2. International Fisheries Conference and Expo : It was a three day International event with many delegates from outside the country. A stall of size 6m x 6 m. were allotted to KUFOS. Academic, Research and Extension activities and achievements of KUFOS were well showcased in the event. Besides these, the leaflets on various technologies developed and standardized at KUFOS were distributed to the participants on need basis. More than 800 participants were visited the stall during the event.

Photographs showing the activities of the stall



3. Malayala Manorama Karshikamela -2024 Malappuram : It was a five day exhibition event hosted by Malayala Manorama at Malappuram. A stall of size 3m x 3m.were allotted to KUFOS and was displayed with Brochures and leaflets highlighting the activities and achievements of KUFOS in the field of teaching, research and extension. People visited the stall ranges from school childrens, farmers, scientistis, general public etc. A sales counter of Tissue cultured Aquarium plants & Terrarium developed by KUFOS officials was also attached to the exhibition stall. The total number of visitors were more than 4000 of which 1000s were students.

Photographs showing the activities of the stall



4. Chief Minister's Face to Face Programme-2024 : The objective of the programme was the interaction with farmers of the state ie, Karshakasamvadhham. It was a one day programme held at Alapppy and a stall of size 2m x 2m. was arranged for KUFOS to display the visual aids showing the activities and achievements of the University. The stake holders and chief official of the agriculture and fisheries sector were participated in the event.

Photographs showing the activities of the stall



5. Apart from the above three, KUFOS has participated in four career Expo in various part of the state. The details of various academic programmes were showcased in the exhibition along with distribution of Brochures.





Centre for Field Consultancy and Data Analysis

Principal Investigator- Dr. Rajesh K, Assistant Professor

Introduction

A massive amount of data being produced each and every day in the 21st century and which makes the data revolution in a way that we have never imagined. The collection of data or repository of data which will help the policy makers, researchers and business to formulate objectives, schemes, products and services. Fisheries sector generates huge amount of data because of disaggregated nature of production and consumption, multiple levels and types of technologies and impact of various agro climatic and socioeconomic factors. The existence of this centre is justified at this context. The ultimate objective of this Centre is to provide fisheries sector data through single window.

The major objectives

- To collect world region-wise fisheries sector data relating to resources, production, fisheries trade, etc.
- Collection of data on production of fish in India and Kerala, species-wise and category wise and its documentation.
- Collection of data relating to marine products export, fishery resources, fisherfolk, etc., of Kerala and India and its documentation.
- 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.

Establishment of Training cum Demonstration Centres in Cage Aquaculture at Kollam and Kannur Districts of Kerala

Principal Investigator- Dr. Dinesh K, Assistant Professor

- The current project is envisaged to establish cage culture units in two geographical zones of Kerala; North zone and South zone. In North zone, Payyannur, Kannur District has been selected and In South zone, Mundrothuruth, Kollam was selected for the implementation of the project. 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. This has been successfully demonstrated with the assistance of the Directorate of Extension, KUFOS.
- In the first few months, the team surveyed and followed the pilot projects operated by the farmers for better understanding 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 and conducted the same awareness class at Mandrothuruth, Kollam on 13.06.2019. The department of fisheries also collaborated with the programme. The inputs for the projects were procured from various agencies adhering to the Government norms. In both sites, 6 units (3 cages in a single unit) were erected with the dimension of 2x2x1.5 m for a single cage. Each cage unit was assigned to a group of three beneficiaries. Altogether 6 groups of beneficiaries (18 beneficiaries) were formed at each site. Furthermore, the beneficiaries were provided with fish seed, feed, freezers for storing the feed, as well as other inputs that were necessary. A total number of 4230 *Lates calcarifer* fingerlings were stocked with a stocking density of 250 no. of seed/ cage at Kollam. In Payyannur, only 4 units were stocked with *Lates calcarifer* with a stocking density of 350/ cage. The culture period was from November to June. Conducted a one-day seminar to all beneficiaries at Payyanur on 28/11/2020

and at Kollam on 09/01/2021 to give, on the farm advice to them with the help of a cage culture expert. The project team has provided all the necessary technical support to the beneficiaries. Regular monitoring of water quality, feeding pattern and health of animals were also done. Harvest of both the sites was done during the first week of June. A total of 385 kg of fish was obtained from Payyanur site and a total of 394 kg fish was harvested from Kollam site. The weight and length of the fish varied from 1400 g to 350 g/ fish and 44 cm to 17 cm / fish respectively. The beneficiaries from both the sites got the highest farm gate price available in the market.

Pandit Karuppan Chair

XI. Livelihood Status of Marine Fishermen in Kerala in the Post COVID-19

Principal Investigator- Dr. Rajesh K Assistant Professor

Kerala is one of the most active marine States in India, with a coastline of well over 590 km and an Exclusive Economic Zone (EEZ) of 218536 sq. km. The state is endowed with 44 rivers, 30 reservoirs, 45 backwater bodies, and is rich in marine wealth. There are 222 marine fishing villages and 113 inland fishing villages in this sector. The coastal line of Kerala is spread over nine coastal districts such as Thiruvananthapuram, Kollam, Alappuzha, Ernakulam, Thrissur, Malappuram, Kozhikode, Kannur and Kasaragod. Among this, the population of fishermen is the highest in Thiruvananthapuram with 1.73 lakh people, which is followed by Alappuzha with 1.32 lakh. The fishing sector contributed approximately 1.76% percent of the GVA and total export of marine product from Kerala is 182430 MT during the year 2021-22 (GoK, 2021-22). Among the nine coastal states of India, Kerala holds the third position in terms of fisherfolk population (GoI, 2021-22). The total populace of fisherfolk residing in the State of Kerala is estimated to be 10.54 lakh, which includes 8.12 lakh in the marine sector and 2.42 lakh in the inland sector (GoK, 2022). Out of this, the number of active fishermen is 2.40 lakh (1.90 lakh in marine sector and 5.08 in the inland sector).

The COVID-19 pandemic had a devastating impact on all sectors across the globe, particularly the fishery sector; Kerala is also not an exception. During the lock-down period, fishing was banned and the fishing harbours and landing centres were closed, which directly affected not only the fisherfolk but also the workers engaged in fish vending, peeling, curing, and harbour-related work. (GoI, 2020). Kerala allowed low intensity fishing operations by artisanal fishers by the first week of April, 2020, about two weeks after imposing the first lock down. It can be seen that a total per day loss of Rs. 58 crore and an accumulated loss of Rs. 3481 crore for 60 days since lock down were incurred (Ramachandran et al., 2020). This loss was estimated from fish landings, price realisation both at the landing centre and retail markets as well as reduction in export earnings. The income loss from fisherfolk was approximately 130 crore and the immediate lockdown and closure of landing centres left many fisherfolk locked in different places and around, 6.4 lakh tons of fish production was at a standstill. The continuous lockdown affected the fisherfolk livelihoods, especially their income and employment. Fishers also suffered during corona, in addition to increasing their debt and loans became uncollectible. Though the fisheries sector ban was completely lifted and the harbours and landing centres started to function, it takes lot of time for the stake holders to get a feel of a vibrant fish market. Fisherfolk are reeling under severe crisis with lockdown, fuel price hike, weather warning, poor landing, etc. Therefore, this study is to investigate the impact of the

COVID-19 pandemic on the livelihood of marine fisherfolk and to identify the changes and challenges that have arisen in their livelihoods during and after the pandemic.

The project mainly studies the livelihood status of marine fisherfolk in Ernakulam in the post Covid 19 period. The main objectives are:

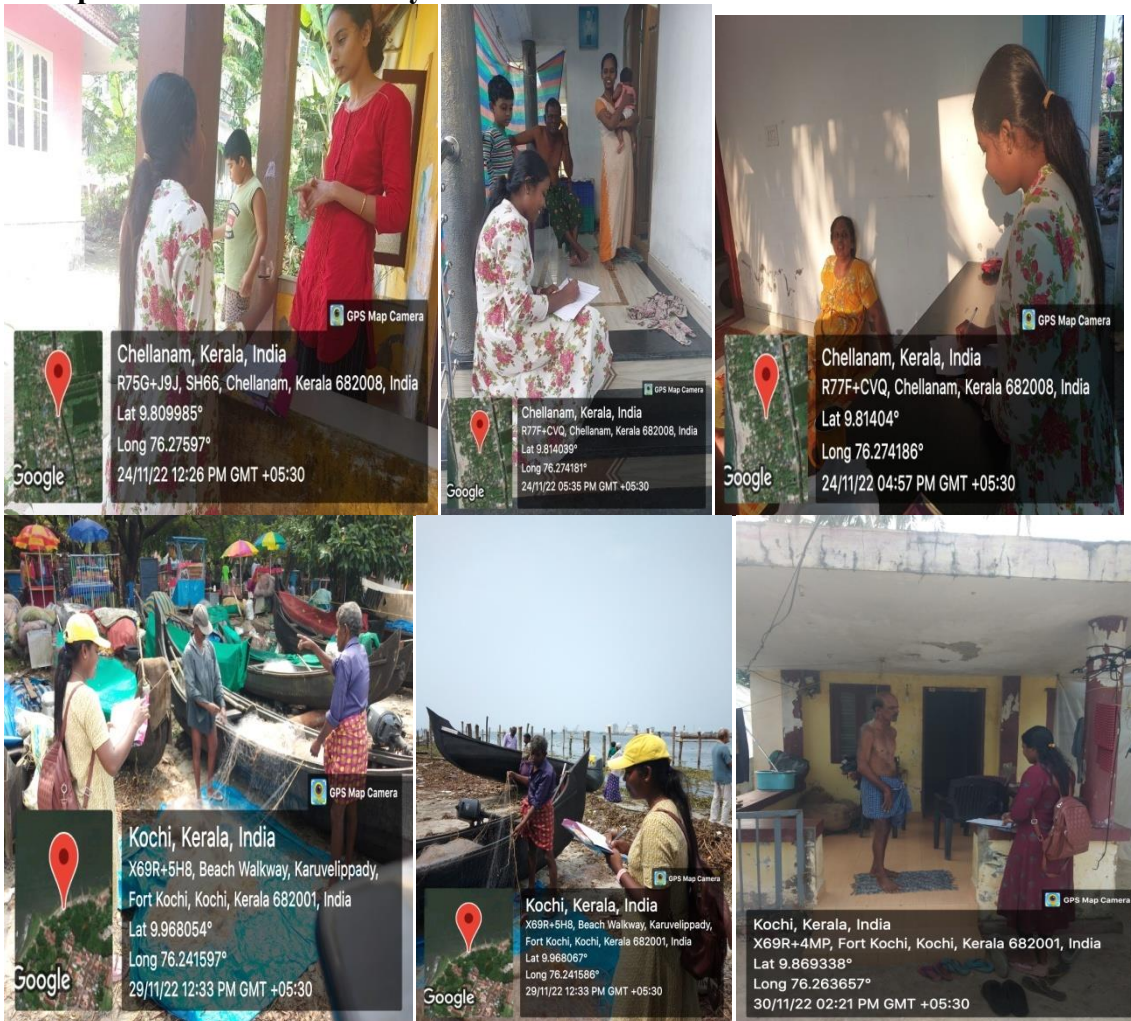
- ☒ To study the socio-economic profile of marine fishermen community;
- ☒ To study the livelihood changes of marine fishermen in Ernakulam in the post Covid Period.

This study employed a purposive sampling approach to gather data from marine fisherfolk in Kerala, with a specific emphasis on the Ernakulam District. Primary and secondary data sources were used in this study. Primary data was collected through personal interviews using a well-structured questionnaire by strictly observing the Covi-19 protocol. Respondents were selected based on simple random sampling. Data was collected from the coastal fishing villages of Ernakulam District, including Chellanam, Munamabam, Vypin, Puthuvypin, Nayaramabalam, Fort Cochin, Puthenthode, Kannamali, Malipuram, Njarakkal, Cherai, and Thoppumpady from January 2022 to January 2023. The sample size was estimated to be 384 using Cochran's formula. Secondary data was collected from articles, journals, and government-authorized reports. From the survey, The profile of fisherfolk revealed that the fisheries sector is **male-dominate** and older generations are more engaged in fishing than the younger. Fishing communities are dominated by Hindus (59.6%) and Christians (38.0 %).The majority of fishers (64%) had education upto the primary level (Up to 7th).There are 78.4% of households being nuclear in nature and greater part of the fisherfolk belong to BPL category (89.8 %). Government housing schemes have significantly benefited the fisherfolk community, with an impressive 95.3% of them now residing in their own homes. The majority of these households enjoy essential amenities such as safe drinking water, electricity, and sanitation facilities. Due to the inconsistent income generated from fishing and the pursuit of higher education by some family members, a shift towards stable income jobs has become prevalent among the fisherfolk family (53.9%).A minimal proportion of working women, accounting for only 15.8%, is observed in each fishermen family. It was found that 93.8 % of the fishermen were traditional fishermen. Fishing is the main source of income for fishermen, most of whom are directly and indirectly engaged in fishing activities. The study also reveals that fisherfolk primarily rely on other fishing boats for their livelihood, with shared vessel ownership being common (84.4%), while only a minority (15.6%) own their own fishing assets such as gears, crafts, and engines due to high costs and maintenance. Regarding occupational flexibility, the study indicates that 56.8% of fisherfolks are fully committed to fishing and lack the skills for alternative employment during the off-season. They experience complete unemployment during fishing holidays.

The Majority of fisherfolk (71.6 %) are working in motorized boats, with 47.4% operating as partners, 20.1% as employees, and 3.3% as boat owners. Corona virus affected around 29.7% of fisherfolk. It is reasonable to assume that 69.3% of the population are unaffected, followed by 1.0% of fisherfolk are unsure about the effect. The lockdown reduced the daily income and employment of fisherfolk. Because of fishing restrictions, 40.6 % of fishermen could not fish during the pandemic period. However, many of those who went had extreme (19.5%) or moderate losses (27.6%). Almost 10.4% of fisherfolk refuse to disclose their losses. On the other hand, there were 53.1 % of fisherfolk who faced moderate losses after the pandemic. Following the outbreak of Covid-19, there was a noticeable overall increase in fishing costs, with a higher proportion of fisherfolk incurring expenses between Rs. **10,000 to Rs. 1 lakh/year**. The economic impact of the pandemic, coupled with external factors such as fluctuating oil prices, has led to higher operational expenses for fisherfolk, posing potential challenges to their livelihoods. Research reveals that fisherfolk often grapple with substantial debt burdens and a lack of effective saving habits. Around 45.3% of fisherfolks carry debts ranging between

Rs. 80,000 and Rs. 1 lakh, while 39.8% have debts exceeding Rs. 1 lakh. A significant number of fishermen borrow money primarily for family expenses rather than fishing, with money lenders being the predominant source of loans for marine fisherfolk (41.1%), contributing to elevated levels of indebtedness in their lives. Despite fishermen noting an enhancement in their social well-being, they grapple with various challenges in their livelihoods. One critical concern is the escalating fuel costs and the unjust pricing of their catch, as intermediaries exploit this situation. The younger generation within the community is reluctant to enter this field due to these issues, resulting in a labour shortage in the marine sector, which has been addressed by the influx of migrant labourers. Similarly, they are not yet able to deal with uncertain risks like Covid-19. Hence, it is imperative for the government to implement effective policy measures to address the challenges faced by fisherfolk in both their livelihoods and daily lives. The project was completed on 31st March, 2023.

Glimpses of the of the Survey and Data collection





**XII. Business strategies and models for managing fisheries sector and marketing of fish products: A study with special emphasis on COVID- 19 Outbreak in Kerala
Principal Investigator- Dr. Anoop K K, Assistant Professor**

During the initial 3 months, literature survey was conducted to identify the theoretical aspects regarding the subject. There are not so many literature which supports the topic, so field visit was considered as the means to gather the information from the fisherfolk. As a part of field visit, different fish markets at chellanam, Vypin, Andhakaranzhy, Chambakara, Palluruthy and Thevara were visited. The survey was mainly focused on the modern hygienic fish markets which were listed by Kerala State Coastal Area Development Corporation (KSCADC).



Later on, in the year of 2022-2023, A questionnaire was framed based on the information collected through pilot the study and field visit. There were certain problems regarding the questionnaire and was reframed as per the requirement of the project. Secondary data was collected from other fisheries institutions like CIFT. Primary data was collected from the markets at Paravoor, and Thevara. Work working on data collection from the Ernakulam District.

Center for Studies on Gender Concerns in Fisheries and Entrepreneurship Development

Principal Investigator- Dr. Shyni K, Assistant Professor

The centre would act as an axis to study the Gender issues in Fisheries sector and to recommend suggestions to overcome the these issues along with bringing about gender sensitivity and gender perspective in research, extension and educational efforts in fisheries and allied fields set in the larger context of natural resource management. The center also focuses on increasing and facilitating women's role and participation in fisheries development along with men and attaining gender justice in the context of the planned efforts in the socio-economic development in Kerala. As part of the project, the following programmes were conducted