



# ICAR - CIFT



## Innovative Engineering Technologies for Post-Harvest Fisheries

ICAR - CENTRAL INSTITUTE OF FISHERIES TECHNOLOGY

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# MAJOR AREAS OF RESEARCH

Design and development of fish processing equipment and machineries



Design and development of energy efficient and eco-friendly solar fish dryers



Design and development of indigenous electronic instruments for application in harvest and post-harvest technology of fish



Quality improvement of Indian fishing fleet



Energy and water optimization techniques for fish processing industry





**SOLAR ELECTRICAL HYBRID DRYER**

## SOLAR ELECTRICAL HYBRID DRYER

<b>Dryer Dimension (m)</b>	:	1.85 × 0.85 × 1.3
<b>Heat absorbing area</b>	:	8 m <sup>2</sup>
<b>No: of trays</b>	:	10
<b>Tray dimension (m)</b>	:	0.9 × 0.6 × 0.02
<b>Tray material</b>	:	Food Grade SS 304
<b>Alternate energy back up</b>	:	Electrical (Two coils of 1000W)
<b>Total drying time</b>	:	6 - 8 h
<b>Loading capacity</b>	:	20 kg
<b>Approximate cost*</b>	:	Rs. 1.25 to 1.5 lakh
<b>Suitable products</b>	:	Fish, vegetables, fruits and agro-products

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**SOLAR - LPG HYBRID DRYER**

## SOLAR - LPG HYBRID DRYER

<b>Dryer capacity</b>	:	50 – 60 kg
<b>Overall dimension (L × W × H), m</b>	:	4.23 × 1.00 × 1.80
<b>Drying chamber dimension (L × W × H), m</b>	:	2.46 × 1.00 × 1.80
<b>No: of solar radiation collector</b>	:	4
<b>Total heat absorbing area</b>	:	12 m <sup>2</sup>
<b>Solar tracking system</b>	:	Manual
<b>Alternate energy back up</b>	:	LPG
<b>No: of trays</b>	:	60
<b>Tray dimension (L × W × H), m</b>	:	0.80 × 0.45 × 0.025
<b>Tray material</b>	:	Food Grade SS 304
<b>Blower</b>	:	4 Nos. (0.5 HP)
<b>Heat exchanger</b>	:	2 Nos.
<b>Heating coil</b>	:	2 Nos. (1000 W)
<b>Total drying time</b>	:	6 - 8 h
<b>Approximate cost*</b>	:	Rs. 3.5 to 3.75 lakh
<b>Suitable products</b>	:	Fish, vegetables, fruits and agro-products

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**SOLAR CABINET DRYER WITH ELECTRICAL BACK UP**



## SOLAR CABINET DRYER WITH ELECTRICAL BACK UP

<b>Dryer Dimension (m)</b>	:	3.1 × 2.45 × 1.3
<b>Heat absorbing area</b>	:	7 m <sup>2</sup>
<b>No: of trays</b>	:	36
<b>Tray dimension (m)</b>	:	0.9 × 0.5
<b>Tray material</b>	:	Food Grade SS 304
<b>Alternate energy back up :</b>	:	Electrical (Two coils of 1500 W)
<b>Total drying time</b>	:	8 - 10 h
<b>Loading capacity</b>	:	40 kg
<b>Approximate cost</b>	:	Rs. 2.25 to 2.50 lakh
<b>Suitable products</b>	:	Fish, vegetables, fruits and agro-products

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**ELECTRIC CABINET DRYER**

## ELECTRIC CABINET DRYER

<b>Dryer Dimension (m)</b>	:	1.25 × 1 × 1
<b>Heat source</b>	:	Electrical
<b>Energy requirement</b>	:	1000 W
<b>No. of trays</b>	:	5
<b>Tray Dimension (m)</b>	:	1.00 × 0.69
<b>Tray material</b>	:	Food Grade SS 304
<b>Total drying time</b>	:	8 - 10 h
<b>Loading capacity</b>	:	5 kg
<b>Approximate cost</b>	:	Rs. 20,000/-
<b>Suitable products</b>	:	Fish, vegetables, fruits and agro-products

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**ELECTRICAL DRYER**

## ELECTRICAL DRYER

<b>Dryer Dimension (m)</b>	:	0.56 × 0.61 × 1.65
<b>Heat source</b>	:	Electrical
<b>Energy requirement</b>	:	Two coils of 1500 W
<b>No: of trays</b>	:	10
<b>Tray Dimension (m)</b>	:	0.54 × 0.55 × 0.025
<b>Tray material</b>	:	Aluminium frame and stainless steel wire mesh
<b>Total drying time</b>	:	6 - 7 h
<b>Loading capacity</b>	:	10 kg
<b>Approximate cost</b>	:	Rs. 35,000/-
<b>Suitable products</b>	:	Fish, vegetables, fruits and agro-products

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*

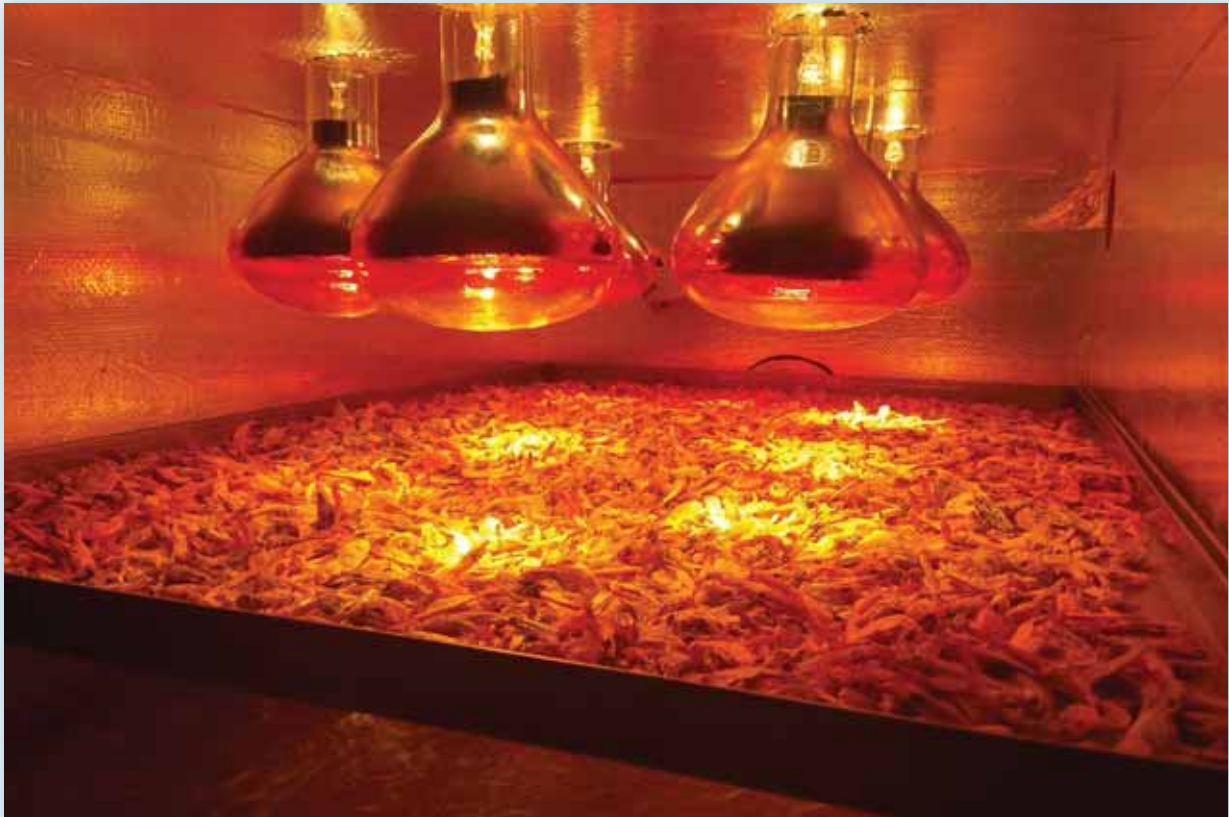


**SOLAR TUNNEL DRYER**

## SOLAR TUNNEL DRYER

<b>Dryer Dimension (m)</b>	:	4 × 3 × 2
<b>Floor area (m<sup>2</sup>)</b>	:	12
<b>No: of trays</b>	:	12
<b>Tray material</b>	:	Wood and iron mesh
<b>Dryer material</b>	:	UV stabilized transparent polythene sheet (200μ), black absorber sheet for floor, supporting frames - CPVC and GI
<b>No: of inlet &amp; exhaust fans</b>	:	3
<b>Loading capacity</b>	:	50 kg
<b>Approximate cost</b>	:	Rs. 67,000/-
<b>Purpose</b>	:	Drying of seasonal higher catch/landing of fish

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



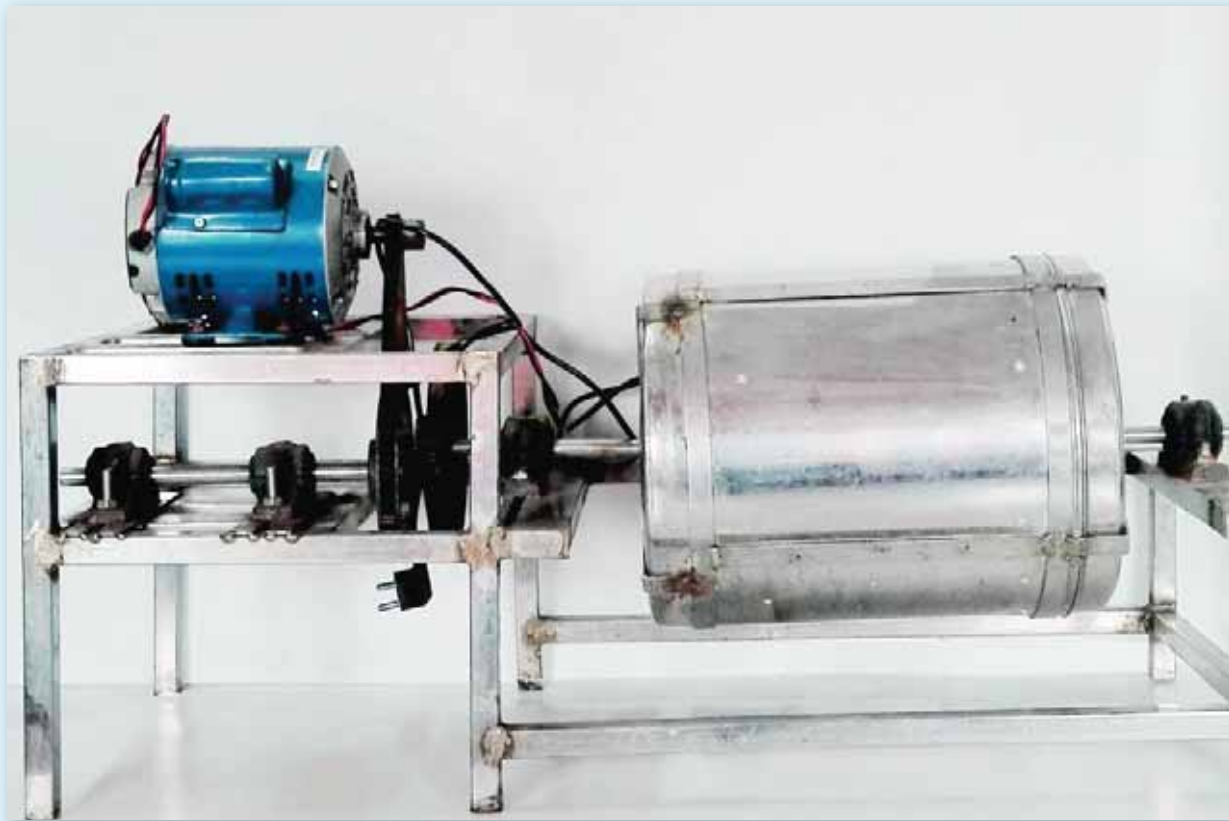
**INFRARED FISH DRYER**



## INFRARED DRYER

<b>Drying Chamber Dimension (m) :</b>	1.22 × 0.92 × 0.38
<b>Material :</b>	Marine plywood inside coated with aluminium foil
<b>No: of trays :</b>	1
<b>Tray dimension (m) :</b>	1 × 0.6 × 0.025
<b>Tray material :</b>	Food Grade SS 304
<b>No: of Infrared Lamps :</b>	8 (150 W each)
<b>Total drying time :</b>	3 - 4 h
<b>Loading capacity :</b>	4 kg
<b>Approximate Cost :</b>	Rs. 15,000/-
<b>Suitable products :</b>	Shrimp, small fishes and other high value agricultural products

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**MOTORIZED FISH DE-SCALING MACHINE WITH FIXED DRUM SPEED**

## MOTORIZED FISH DE-SCALING MACHINE WITH FIXED DRUM SPEED

<b>Use</b>	:	To remove the scales of fish easily
<b>Suitable for</b>	:	All types / sizes / species of fish
<b>Capacity</b>	:	5 kg / batch
<b>Power requirement</b>	:	230 V AC single phase for 0.5 HP motor
<b>Material</b>	:	Food grade SS 304
<b>Drum Dimension (mm)</b>	:	345 × 430 (Diameter x Length)
<b>Drum Speed range (rpm)</b>	:	20 – 30
<b>Approximate Cost</b>	:	Rs. 15,000/-

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**FISH DE-SCALING MACHINE - HAND OPERATED**

# FISH DE-SCALING MACHINE HAND OPERATED

<b>Use</b>	:	To remove the scales of fish easily
<b>Suitable for</b>	:	All types / sizes / species of fish
<b>Capacity</b>	:	3 kg / batch
<b>Operation</b>	:	Manual
<b>Material</b>	:	Food grade SS 304
<b>Drum Dimension (mm)</b>	:	255 x 270 mm (Diameter x Length)
<b>Approximate Cost</b>	:	Rs. 5,000/-

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**FISH DE-SCALING MACHINE WITH VARIABLE DRUM SPEED**

## FISH DE-SCALING MACHINE WITH VARIABLE DRUM SPEED

<b>Use</b>	:	To remove the scales of fishes easily
<b>Suitable for</b>	:	All types / sizes / species of fishes
<b>Capacity</b>	:	10 kg / batch
<b>Power requirement</b>	:	230 V AC to drive 1.5 HP motor and VFD
<b>Material</b>	:	Food grade SS 304
<b>Drum Dimension (mm)</b>	:	350 x 650 (Diameter x Length)
<b>Drum Speed range (rpm)</b>	:	0 - 100
<b>Approximate Cost</b>	:	Rs. 1 lakh

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**TABLE-TOP HANDY FISH DESCALING MACHINE**



## TABLE-TOP HANDY FISH DESCALING MACHINE

<b>Use</b>	:	To remove scales of fish easily
<b>Suitable for</b>	:	All types / species of fish
<b>Capacity</b>	:	1 kg / batch
<b>Operation</b>	:	Motorized
<b>Drum dimension (mm)</b>	:	190 × 225 (Diameter × length)
<b>Drum speed range (rpm)</b>	:	20 - 30
<b>Approximate cost</b>	:	Rs. 3000/-

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**MODERN HYGIENIC MOBILE FISH VENDING KIOSK**

## MODERN HYGIENIC MOBILE FISH VENDING KIOSK

<b>Full body material</b>	:	SS 304 food grade material
<b>Major parts</b>	:	Insulated fish chilled storage cum display facility, Hand operated de-scaling machine, Fish dressing deck with wash basin, Waste collection chamber and working space
<b>Design variation</b>	:	U Shape, L shape, Straight line shape
<b>Refrigeration capacity</b>	:	400 L
<b>Insulation</b>	:	Puff insulation (3 inch thickness)
<b>Electric rating</b>	:	220 - 240 V (AC 50 - 60 Hz.)
<b>Power consumption</b>	:	300 watts
<b>Fish display unit top</b>	:	Poly carbonate / toughed glass material
<b>Loading capacity</b>	:	20 kg under chilled storage, 80 kg under Ice box
<b>Approx. Cost</b>	:	Rs. 60,000/-
<b>Temp. of chilled storage</b>	:	2 - 4° C
<b>Dimensions in m (L×W×H) of straight line shape</b>	:	1.28 × 0.75 × 0.85 – Storage chamber 1.12 × 0.75 × 0.75 – Cutting table

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**SPECIMEN COLLECTION AND TRANSPORTATION DEVICE**

## SPECIMEN COLLECTION AND TRANSPORTATION DEVICE

- Purpose** : Used to store and transport specimens under 2-3° C and temperature attains within 25 minutes
- Cooling capacity** : 5 litre
- Material** : Made up of thermocol, cardboard box and plywood.  
12V (15 amps) Peltier module (180W) (thermoelectric cooler) was used for air cooling and provided with battery backup.  
Provided with LED display for temperature.
- Approximate cost** : Rs 10,000/-

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*



**EFFLUENT TREATMENT PLANT**

# EFFLUENT TREATMENT PLANT

- Use** : Treatment of effluent water from fish processing unit.  
Treated effluent will conform to PCB norms
- Capacity** : 25,000 - 10,00,000 litre
- Structure** : Reinforced cement concrete (RCC)
- Features** : Energy efficient system; Requires only 2 numbers of 1 HP motors
- Benefits** : Zero pollution atmosphere and eco-friendly  
Less power consumption  
Ease of operation  
The water will be suitable for reuse in the plant  
Low cost of construction



**COMMUNITY FISH SMOKING KILN (COFISKI)**



## COMMUNITY FISH SMOKING KILN (COFISKI)

<b>No: of trays</b>	:	8
<b>Tray material</b>	:	Food grade SS 304
<b>Tray dimension (mm)</b>	:	500 x 450
<b>Smoking chamber insulation</b>	:	2" thick aluminium foil laminated glass-wool pad
<b>Kiln dimension</b>	:	750 x 550 mm
<b>Smoking chamber dimension</b>	:	1080 x 650 mm
<b>No: of chimney</b>	:	1
<b>Capacity</b>	:	20 kg / charge of 3 hours
<b>Approximate Cost</b>	:	Rs. 40,000/-
<b>Benefits</b>	:	Better health, hygiene, quality product with longer shelf life and lesser carbon foot print

*\* Approximate cost given is subject to change as per the price variations of manufacturing materials and firm's policy.*

### Technical support and guidance for setting up of

- Eco friendly and energy efficient hybrid solar dryers for hygienic drying of fish and agro products
- Modern and hygienic mobile fish vending kiosk
- Fish de-scaling machine
- Fish chilling unit / freezer
- Engine testing and validation of fishing vessels and canoes
- Cold storage unit for fruits / vegetables / spices
- Effluent Treatment Plant

## FACILITIES AVAILABLE



# UPCOMING TECHNOLOGIES

- Continuous type IR Dryer ( 50 kg capacity)
- Improved solar-electrical cabinet dryer
- Fish freshness sensor
- Live fish transportation system
- Solar based fish feed dispenser
- Solar based aerator for aquaculture
- Emission less biomass / biochar fish dryer
- Customised framework for energy and water optimisation in seafood processing firms



## RECOGNITIONS

**SKOCH Order of Merit Award (2018)**

**Skoch Evergreen Platinum Award for Green, Clean and Affordable Energy (2018)**

**Kerala State Energy Conservation Award and Commendation Certificate (2018)**

# IN MEDIA

## CIFT's solar fish dryers finds several takers

**DC CORRESPONDENT KOCHI, SEPT. 20**

The solar hybrid fish dryer introduced by the Central Institute of Fisheries Technology is getting popular. The dryers innovated by CIFT as an alternative to traditional sunlight-dependent dry fish processing ensure high quality and hygienic dry fish products.

"The dryers have been designed to regain the lost glory of dry fish sale with emphasis on hygiene, quality and round-the-year operational features.

Lower and uniform levels of moisture can also be achieved for products from solar dryer compared to the conventionally dried products. More entrepreneurs have started setting up the dryers," said Dr. Manoj P. Samuel, principal scientist and head, engineering division at CIFT.

"As people have become more aware about the hygienic standards of conventionally processed dry fish products, there has been a decline in dry fish markets. Availability of fresh fish round-the-year also has affected the sale of

dry fish. Even during the trawl ban period in Kerala, fresh fish from other states was available," he observed.

The dryer with a capacity of 20 kg is priced at ₹1 lakh while the other one with a capacity of 50 to 60 kg is worth ₹3 lakh.

More entrepreneurs are using the dryer installed at the CIFT incubation centre. Fish sellers from across the state bring fresh fish to the centre and get it dried and processed for sale. And more fish traders have started setting up the facility on their own.

## CIFT 'ENGINEERS' KIOSK TO STOP FLIES FROM 'FISHING'

**DESAI PETER**

The fish that is almost burning in heat here, you can watch people dance around from a fish market water tank in Kerala.

While fishermen used to have their fish dried near by tanks, the fish is now being dried in a kiosk.

The kiosk is a small structure that is made of metal and has a solar panel on top. It is used to dry fish.

The kiosk is a small structure that is made of metal and has a solar panel on top. It is used to dry fish.



best conditions," Head Scientist, Air Unit, Thiruvananthapuram, said.

"We have also equipped the kiosk with solar panels and all that is needed to run the kiosk is electricity," he said.

through air blowing dryers, the fish is dried in the kiosk. There are two types of dryers - one with a capacity of 20 kg and another with a capacity of 50 to 60 kg.

"The kiosk is a small structure that is made of metal and has a solar panel on top. It is used to dry fish.

## വെച്ചിലൂറ്റിയൊരും മത്സ്യമുണങ്ങും; സിഫ്റ്റിന്റെ ഡ്രയർ എത്തി



മത്സ്യം ഉണർക്കാനുള്ള സൗകര്യം നൽകുന്നതിനായി സിഫ്റ്റ് കോഴിക്കോട് സ്ഥാപിച്ച ഡ്രയർ കിടപ്പിലുണ്ട്. ഇത് സൂര്യനോടൊപ്പം പ്രവർത്തിക്കുന്നതാണ്. ഇതിന് വൈദ്യുതിയോടൊന്നും ബന്ധമില്ല. ഇത് മത്സ്യം ഉണർക്കാനുള്ള സൗകര്യം നൽകുന്നതിനായി സിഫ്റ്റ് കോഴിക്കോട് സ്ഥാപിച്ച ഡ്രയർ കിടപ്പിലുണ്ട്.

മത്സ്യം ഉണർക്കാനുള്ള സൗകര്യം നൽകുന്നതിനായി സിഫ്റ്റ് കോഴിക്കോട് സ്ഥാപിച്ച ഡ്രയർ കിടപ്പിലുണ്ട്. ഇത് സൂര്യനോടൊപ്പം പ്രവർത്തിക്കുന്നതാണ്. ഇതിന് വൈദ്യുതിയോടൊന്നും ബന്ധമില്ല. ഇത് മത്സ്യം ഉണർക്കാനുള്ള സൗകര്യം നൽകുന്നതിനായി സിഫ്റ്റ് കോഴിക്കോട് സ്ഥാപിച്ച ഡ്രയർ കിടപ്പിലുണ്ട്.

# CLIENT FEEDBACK

“

Coming to ICAR-CIFT has been a turning point in my life. I began my first step as an incubatee at ABI Centre, CIFT and launched my products into the market under the brand name EMMA FOODS. Now I have set up my own Solar Dryer unit at Kumbalangi, Kochi. The ICAR-CIFT designed dryer enables to make premium dry fish products at low operational costs. Now I am a wholesale and retail distributor of solar dried fish products”



**Mr. John Martin N.D.**

**EMMA FOODS**

Nedumparambil, Keltron ferry road  
Kumbalangi South P.O  
Ernakulam



“ I started an exclusive retail outlet for solar dried fish products, under the name AABBAA, the first of its kind in Kochi. My journey started as an incubatee firm at ICAR-CIFT, and within a few months I was able to open the retail store. I get so much positive feedback from my customers for solar dried fish, in terms of hygiene, retention of nutrients, aroma and taste. Thanks to the officials of Engineering Division and ABI Centre. ”



**Mr. Jose Mathew M.M.**  
**AABBAA FISH PRODUCTS**  
St.James Church Bldg.  
Chambakkara Fish Market  
Ernakulam



# CLIENT FEEDBACK

“

ICAR-CIFT designed dryer perfectly suited my business needs and the use of solar energy definitely gave me a remarkable edge, particularly in terms of cutting the operational expenses. I make dried agro products that has premium quality and they fetch very good market price. The weather proof design gives ample protection to the products and it is also quite easy to control the temperature as it includes adjustable venting features. ”



**Shri. Anish Mathew**

Arapalickal House,  
Cherpunkal P.O., Pala- 686584,  
Kottayam, Kerala



“ I attended the three day training programme organised by ICAR-CIFT on pre-processing and drying techniques. It gave me the confidence to go ahead with the business idea of solar dried agro-products. We have set up our own drying unit at Punalur, and the equipment was fabricated by the ICAR-CIFT empanelled manufacturer. The dryer shows optimum performance and products are of very high quality. ”



**Mrs. Sajana Padmakumar**  
**AMMA FOOD PRODUCTS**

Laly Nivas, Plachery (po),  
Punalur, Thazhekadavuthukkal,  
Kollam-691331, Kerala



# INCUBATEE PRODUCT BRANDS



**ANESH PAREED**

Karukunnath House, Peringala PO, Aluva,  
Ernakulam, 683565



**UMMUL HAIRA**

Mangodan House, Alanallur, Palakkad  
678601, Kerala







## JOSEPH PAUL

Pulikal House, Kannamali PO,  
Cochin-682008, Kerala



# CLIENT FEEDBACK

“

My dream of starting a business in my hometown became a reality with the help of ICAR-CIFT. My firm, FRESHPACK, dealing with the sale of fresh fish and dried fish products, is at Vennikulam. I have purchased solar dryer, mobile fish vending kiosk and descaling machine, from the empanelled manufacturers of the Institute. The equipments are very energy efficient, and the customers are satisfied with the good quality of fish supplied. ”



**Shri. Anwar P.S.**  
**FRESHPACK**

Puthanpurayil House, Puthencruz,  
Kokkappilly, Ernakulam - 682305



## MOBILE FISH VENDING KIOSK



### **PARADISE RESORTS**

Near Nazrath Church  
Kumarakom South, P.O.  
Kerala - 686563

### **SANTHOM MART AND FOOD COURT**

Mundamveli  
Kochi, Kerala



# DESCALING MACHINE



## **PARAYIL FOOD PRODUCTS PVT LTD**

Aroor, Alappuzha  
Kerala - 688534

## **THE TOWN HARBOUR**

Near Madom Jn  
Edappally Raghavan Pillai Rd, Kochi  
Kerala - 682024



## CLIENTELE

### **M.S. Swaminathan Research Foundation**

Third Cross Rad, Institutional Area, Taramani,  
Chennai, Tamil Nadu - 600113

### **Cochin Port Trust**

Indira Gandhi Rd, Willingdon Island, Kochi,  
Kerala - 682003

### **Uniloids Biosciences Pvt.Ltd.**

#2-23-11, Plot No. 6, HMT Hills, Sathavahana Colony,  
Kukatpallu, Hyderabad, AP



### **Blue Water Foods and Exports (P) Ltd**

Plot No. 281/282, Industrial Area, Baikompady, New  
Mangalore – 575011

### **Mangala Marine Exim India Ltd.**

9/1564, Bhat Memorial Building, Thoppumpady,  
Cochin – 682005

### **Rahul Foods**

Ela, Dauji, Old Goa, Goa - 403402

### **Department of Fisheries, Govt. of Karnataka**

(3 Fishing harbours)

# COFISKI UNITS



ICAR-CIFT in association with the Corporate Social Responsibility Project of Coal India Ltd, has taken up the distribution of 100 Community Fish Smoking Kilns (COFISKI) to hinter land women fishers. An amount of Rs.50 lakh has been provided as grant by Coal India Ltd., and this project is expected to ensure generation of sustainable income among economically under-privileged rural women fishers.

## STATES COVERED UNDER THE PROGRAMME







## CONTACT US

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