higher conservation of nutritional value. PLC system can be incorporated for automatic control of temperature, humidity and drying time. Solar drying reduces fuel consumption and can have a significant impact in energy conservation.

Hybrid Solar Dryer installations

1. Fish processing Centre at Kattoor, Alappuzha, Kerala
2. ICAR Research Complex for NEH, Imphal
3. Directorate of Fisheries, Manipur
4. Corporation of Cochin, Kerala

Financial Aspects

For dried prawn

Total investment - 19.65 lakhs

Rate of return - 20%

Net profit - Rs.18 lakhs

Market potential

Market size of dry fish

Rs.175 crores (Export market)

- Rs. 550 crores in 2015

Rs.650 crores (Domestic market)

- Rs. 1450 crores in 2015

The Indian Council of Agricultural Research (ICAR) is an autonomous organization under the Department of Agricultural Research and Education, Ministry of Agriculture, Government of India. Formerly known as Imperial Council of Agricultural Research, it was established on 16 July, 1929 as a registered Society under the Societies Registration Act, 1860. One of the important mandates of the ICAR is to plan, undertake, aid, promote and co-ordinate education, research and its application in agriculture, agro forestry, animal husbandry, fisheries, home science and allied sciences. To address the issues concerned with the fisheries development in all the four sectors namely marine, freshwater, brackish water and coldwater, about eight different institutes were established.

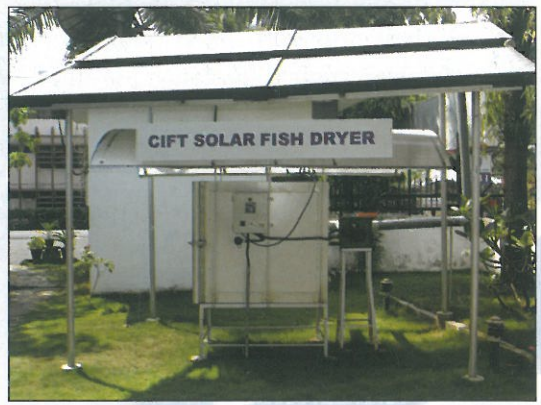
CIFT

The Central Institute of Fisheries Technology (CIFT) is the only technology Institute in India which caters to the entire spectrum of fisheries from harvest to post-harvest operations including harvesting systems, quality assurance, post-harvest handling, preservation, processing and product development, waste utilization, value addition, packaging and transportation, and technology transfer.

The research activities of the Institute are undertaken under the following major Divisions of the Institute:

- Fishing Technology Division
- Fish Processing Division
- Biochemistry & Nutrition Division
- Quality Assurance & Management Division
- Engineering Division
- Extension, Information & Statistics Division
- Microbiology, Fermentation and Biotechnology Division

ECO-FRIENDLY HYBRID SOLAR DRYER FOR HYGIENIC PRESERVATION OF FISH



CENTRAL INSTITUTE OF FISHERIES TECHNOLOGY
(Indian Council of Agricultural Research)
DARE, Ministry of Agriculture, Govt. of India
Willingdon Island, Matsyapuri P.O., Cochin-682 029

ECO-FRIENDLY HYBRID SOLAR DRYER FOR HYGIENIC PRESERVATION OF FISH

Solar-LPG hybrid dryers combine the two sources of energy, the green energies - solar and LPG, thus incorporating the cost advantages of solar dryers, and the reliability of LPG backup system during unfavourable weather conditions. Drying under controlled conditions of temperature and humidity helps to dry the fish rapidly to a safe moisture content level and to ensure a superior quality product with attractive colour. This will ensure quality products eliminating the disadvantages of open sun drying followed in coastal villages. Improved shelf life and value addition of the product fetches higher income for the local population.

Working principle

CIFT, Cochin has developed a novel hybrid system for drying fish using renewable solar energy. In this system, solar vaccum tube collectors installed on the roof, heat the water and are collected in a calorifier tank.

The circulating air is heated by the hot water passing through the heat exchangers. Axial flow fans are provided in the drying chamber for hot air circulation \across the stainless steel trays loaded with fish for drying. When solar radiation is not sufficient during cloudy/ rainy days to heat the water for circulation, LPG back up heating system will be automatically activated to supplement the heat requirement. Thus continuous drying is possible in this system without spoilage of the highly perishable commodity to obtain a good quality dried product. Drying is carried out under controlled temperature and humidity conditions. The complete process parameters of fish drying can be controlled by PLC system.

Advantages of Technology

- Professional, Green Energy, Hybrid drying technology
- Hygienic drying conditions
- All contact parts are made of food grade stainless steel
- Protection against dust, insects, birds, rodents and climatic conditions
- Drying takes place inside a PUF insulated SS lined drying chamber ·
- Reduction of drying time
- Safe and uniform drying to storable conditions
- Drying under controlled conditions of temperature and humidity
- Minimum mass losses
- Improved product quality
- Preservation of nutritional properties
- Application on co-operatives

Uniqueness of technology

Solar heating system is the most viable option for fish drying as it is cost effective compared to furnace oil or diesel heaters and also saves the quantity of fossil fuel required for firing a heating system. Also, it reduces the emission of greenhouse gases.

This machine is ideal for drying fish, fruits, vegetables, spices and agro products hygienically and efficiently, without changing its colour and flavour. It dries faster than open drying in the sun, by keeping the physio-chemical qualities like color, taste and aroma of the dried food intact and with