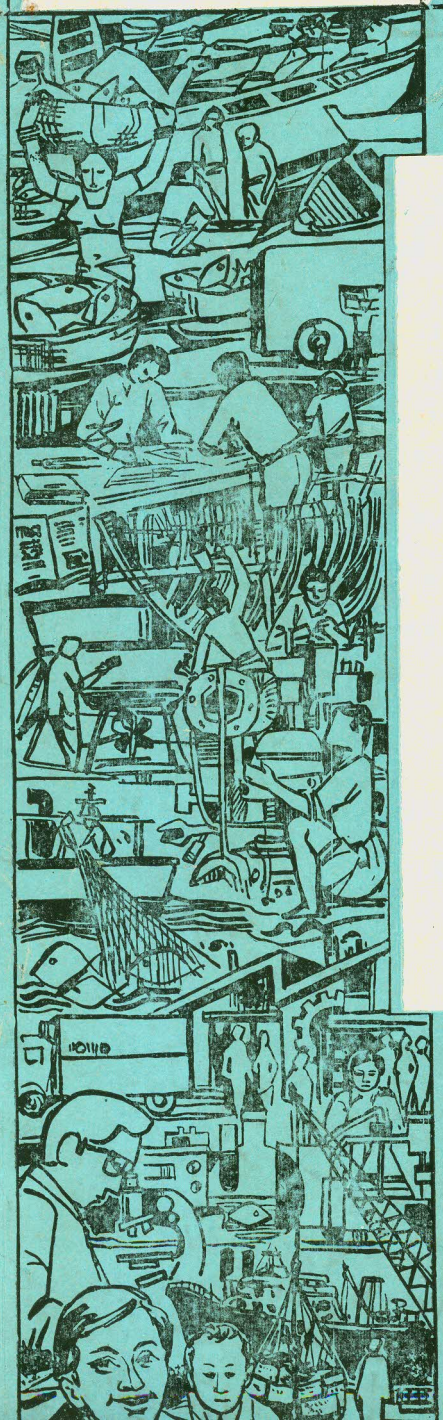
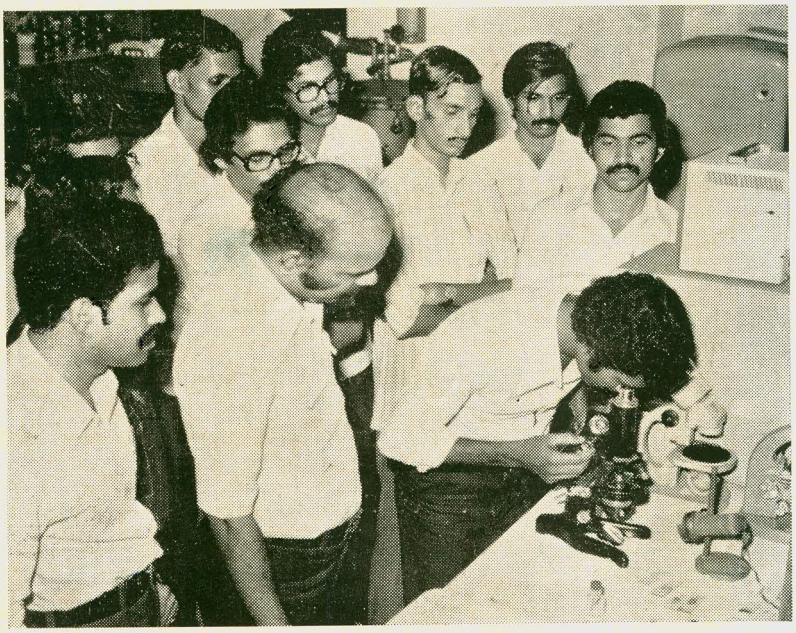
Fish technology newsletter

Vol. III No. 7 MARCH 1983





Training course for Fish Processing Technologists. Report on Page 4

CENTRAL INSTITUTE OF FISHERIES TECHNOLOGY
MATSYAPURI P. O. COCHIN - 682 029

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Foreword

Fish Technology Newsletter is a quarterly intended to bring the fishery industry in India in touch with some of the important developments in fisheries technology resulting from investigations carried out at this Institute and elsewhere. It is not a research publication. Every effort has been earnestly made to express the ideas in non-scientific language. Its ultimate aim is the application of the results of contemporary research for the advancement of our fishery industry

Fish Technology Newsletter does not owe allegiance to any manufacturer, patent, product or development agency unless otherwise specified. Its purpose is to open up a communication channel through which useful ideas can be exchanged, problems discussed and success shared. The process of exchanging views and opinions makes it easier to identify the real issues and that is where problem-solving begins.

We welcome contributions from any source which will help to achieve our above-mentioned aim. The sources of all such contributions will be acknowledged. We sincerely hope that the current events and informations contained in the columns "GLEANINGS FROM OTHER JOURNALS" and "LET'S TALK IT OVER" will be of interest to the Indian fishing and fish processing industries.

We also welcome suggestions from our readers for improvement in the contents and get-up of Newsletter. Any part of this publication may be reprinted in any language if the translation is true and the source is acknowledged.

Abbreviation: Fishtech News

Editorial Committee.

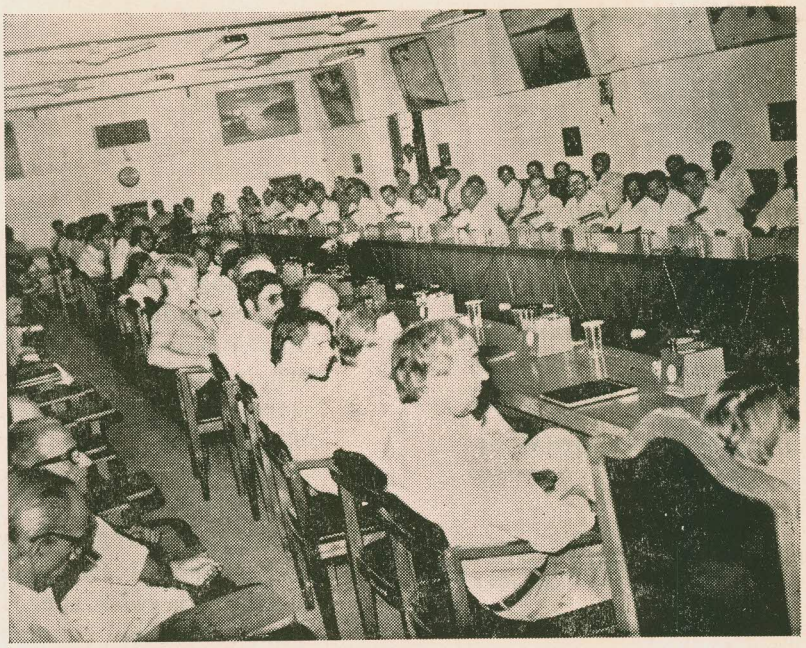
Training Course for Fish Processing Technologists

A three-week training course for fish processing technologists from different parts of the country at the Central Institute of Fisheries Technology (CIFT), Cochin, concluded on March 23, 1983.

Arranged by the Cochin based Marine Products Export Development Authority in collaboration with CIFT, the course was aimed at giving an idea of the quality control methodology in fish processing so that the technology adopted in the country would conform as far as possible to the standards of the Food and Drugs Administration (FDA) of the U. S.

Inaugurating the training course on March 8, Shri. C. Cherian, President of the Seafood Exporters' Association of India, said that hygienic standards in processing plants in the country had improved to a great extent so that there was only 1.5 per cent of filth contamination and decomposition in Indian shrimp consignments, according to a study conducted by CIFT.

Shri S. N. Rao, Chairman of MPEDA, in his presidential address said the training course would also help in equipping technical personnel in the fish processing Industry to cope with the U. S. inspection procedures which once "black listed" Indian consignments of shrimps to reduce the value of Indian Marine Products.



Inauguration of the Training Course

Presiding over the concluding function of the training course, CIFT Director Dr. C. C. Panduranga Rao pointed out that the fish processing Industry in India was fully aware of the importance of quality in accordance with the present day needs as was evident by the participation of the technologists in the training course. "Unless the processed products meet the requirements of quality as specified by the importers, our products will not be accepted by the importers. The quality requirements specified by the U S. FDA are very exact and we should be able to process the products strictly accordingly", he said. Dr Rao cautioned that it was enough to test the products at the final stage of production to assess the quality but the quality control measures should begin from the very raw material.

Much to be done

"The raw material available in India is brought by both traditional and mechanised fishing boats. As regards mechanised fishing boats, the standard of sanitation specified are more or less followed.

A Survey on the Under Utililisation of Fish Processing (Freezing) Plants in India-VIII West Bengal and Orissa*

The states of West Bengal and Orissa together have a coastline of about 680 km. of which 200 km. are in West Bengal. Freezing of prawns for export was started from these states some time in 1970. During 1979, there were 35 freezing plants of which 11 were in Orissa. A sample of 16 plants were selected for estimating the idle capacity as per the stratified sampling plan. Out of these, 11 were under 5tonnes, 2 were 5 to 10 tonnes and 3 were above 10 tonnes capacity, per day. Data on installed capacity, total production and factors responsible for the under-utilisation of plants and ice and cold storage facilities available in these plants were collected for the years 1978 to 1981. The total installed capacity and the stratum-wise idle capacity were estimated for 1978 81 by taking into account 250 normal working days in a year and for single, double and triple shift per day. These figures are presented in the Table.

A view of the audience at the concluding session

There is much to be done in the case of traditional crafts. It is certain that quality control measures will be introduced for all types of vessels in the time to come to satisfy the requirement of quality from the very raw-material stage".

Dr. Rao said that a feed-back programme would be arranged to assess as to what extent the trainees had benefited out of the training they had undergone. He hoped that this would help to improve the quality of the products of the establishments they represent. Dr. Rao awarded course certificates to the trainees.

Earlier, welcoming the gathering, Dr. K. Gopakumar Scientist-in-Charge of the Processing Division said that under the training programme, 52 trainees from fish processing establishments all over India were imparted training. □

IDLE CAPACITY OF FISH PROCESSING PLANTS IN WEST BENGAL AND ORISSA 1978 - 1981

(Based on 250 Normal Working days in a year)

	Single Shift				Double Shift				Triple Shift			
	1978	1979	1980	1981	1978	1979	1980	1981	1978	1979	1980	1981
Annual installed capacity (in thousand tonnes)	16.0	16.6	15.9	15.9	31.9	29 2	31.7	31.7	47.9	43.8	47.7	47.7
Estimated idle capacity (in thousand tonnes)	10.7	9.9	11.0	10.3	26.6	24.5	26.2	26.2	42.8	39.2	42.8	42.1
% idle capacity	67.0	68.0	69.5	64.9	83.5	84 0	84.8	82.5	89.0	89.3	89.9	88.3
Stratum wise % idle capacity												
Plants under 5 tonnes per day	74.8	66.6	66 2	66.0	87.4	83.3	83.1	83.0	91.6	88.9	88.7	88.7
5 to 10 tonnes per day	70.7	71.6	71.9	68.1	85.4	85.8	86.1	84.2	90 2	90.5	90 8	89.5
Above to tonnes per day	43.9	68.5	74 4	60 9	72.0	84.3	87 2	80 5	81.3	89.5	91.5	87.0

Comparative Economic Efficiency of Fishing Trawlers of 9.82 m (32 ft) and 11 m (36 ft)* OAL along Kerala Coast

Of the mechanised fishing fleet of Kerala, a good portion is constituted by small and medium sized trawlers built to the designs prepared by the Central Institute of Fisheries Technology, Cochin. In view of the large number of such trawlers in operation along the Kerala Coast, it was found desirable to appraise their economic efficiency based on the data from actual fishing operations. Fifty trawlers each of 9 82 m (32 ft) and 11 m (36 ft) O A L were selected for gathering the required data. The data collected include total prawn catch, fish catch,total receipts,expenditure on fuel. salaries, and shares, commissions, repairs and maintenance costs, depreci-

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The installed capacity estimated by taking into account 250 working days in a year and double shift/per day for the years 1978-81 were 31.9, 29.2, 31.7 and 31.7 thousand tonnes respectively, while the estimated production during these years were 5.3, 4.7, 4.8 and 5.5 thousand tonnes respectively. The idle capacity of the plants during the four years 1978–81 were estimated to be 83.5%, 84 0%, 84.8% and 82.5% respectively.

Among the maritime states in the east coast of India, idle capacity of the plants was found to be the maximum in West Bengal and Orissa in all the shifts.

The stratum-wise estimate of the idle capacity figures do not show any marked difference between strata.

The major factors responsible for the idle capacity of the plants in West Bengal and Orissa were.

(i) Non–availability of raw material (shrimp)

(ii) Shortage of power

(iii) Labour problems

(iv) Shortage of ice and potable water during peak season

(v) High cost of production

(vi) Lack of transport and cold storage facilities.

Based on the survey, following are few recommendations which will help to reduce the idle capacity of the plants in these two states

(1) Promoting mass aquaculture of prawns to meet the raw material shortage.

(2) Exploration of new prawn grounds and introduction of more deep sea trawlers to boost up the prawn catch.

(3) Subsidy on diesel oil to all class of fishing vessels.

(4) Diversification of the products.

(5) Steady supply of prawn, ice and potable water to fish processing plants.

(6) Improved shipping facilities.

(7) A check on issuing licence to new plants. □

★Prepared by H. Krishna Iyer, P. Sreenlvasa Rao, G. R. Unnithan, A. K. Kesavan Nair and R. G. Nair.

ation, insurance and miscellaneous expenses.

A mathematical model for working out the economics of operation of the two trawler sizes were developed and the percentage profit on total expenditure were worked out for both the trawlers by taking into account 225 fishing trips in a year and they are presented in Table I It is evident from the Table that the profitability of a 9.82 m (32 ft) is better than the 11 m (36 ft) fishing boat.

Table II gives the percentage profit in relation to the number of days of operation of 9.82m and 11 m trawlers. If a 9.82m trawler performs 225 fishing trips in a year, the estimated profit it would have made, is 27.08%. As the number of fishing trips is limited to 200, the profit falls to 13.83% and at 180 fishing trips per year, it further reduces to 2 24% and at 175 trips, the profit is negative. The break-even point for a 9.82 m trawler, therefore, lies between 175 and 180 fishing trips in a year.

For 11m trawlers, the profit estimated to be 23.87% for 225 fishing trips in a year, 10.29% for 200 fishing trips and 1.53% for 185 fishing trips. When the number of fishing trips is reduced to 180, the profit becomes negative. Thus for 11 m trawlers the break-even point lies between 180 and 185 fishing trips in a year.

It is also evident from Table II that the profitability of smaller size of trawlers depends on the number of fishing trips they perform during a year. These boats which operate for less than 180 fishing trips in a year are likely to run on loss. This is mainly due to the high cost of operation of the boats. Out of the total expenditure, fuel cost alone contributes 45%. Most of the boats were unable to cross the break-even point of fishing trips in a year owing to unsteady catch and high cost of fuel. This can be avoided to a certain extent by extending the subsidy on diesel oil to smaller classes of trawlers also.

TABLE - I

COMPARATIVE ECONOMICS OF OPERATION OF FISHING TRAWLERS OF 9.82 M (32 FT) AND 11 M (36 FT) ON THE BASIS OF 225 FISHING TRIPS IN A YEAR

Fixed Cost (a)	11 m (36 ft) Rs.	9.82 (32 ft) Rs.
1. Bank Interest	16500	12000
2. Insurance	11000	8000
3. Loan repayment	18300	13300
4. Repair and maiatenance including cost of implements	16500	12000
5. Depreciation	11600	8400
6. Cost of Gear	1250	1000
7. Berthing charges	2000	2000
Total	77150	56700

Fish Oil Reduces Blood Cholesterol Levels

Investigations carried out at C. I. F. T. have proved that a moderate amount of fish in the diet can control blood cholesterol level in experimental animals Cholesterol concentration in the blood of animals which were given coconut oil alone as the dietary fat was about 1½ times higher than that in the animals which were given coconut oil along with sardine oil. The findings clearly indicate that consumption of fish is helpful in alleviating the harmful hypercholesterolemic effects of saturated fats in our food.

Fish oils differ from common vegetable oils and other oils or fats from animal sources like beef etc., in their very high content of polyunsaturated fatty acids.

Variable Cost (b)		
1. Fuel	56250	49500
2. Wages, Commission and batta for crew	69066	55676
3. Cost of Ice	2250	2250
Total	127566	107426
Total expenditure (a+b)	204716	164126
Total Receipt	253580	208575
Net profit	48864	44449
% profit on Total expenditure	23.9%	27.0%

TABLE - II

PROFIT IN RELATION TO NUMBER OF FISHING TRIPS

11 m (36 ft Boats)		9.82 m (32 ft)	
No. of trips	% Profit	No. of trips	% Profit
225	23 87	225	27.08
200	10.29	200	13.83
185	1.53	180	2.24
180	(—) 1.49	175	(—) 0.79

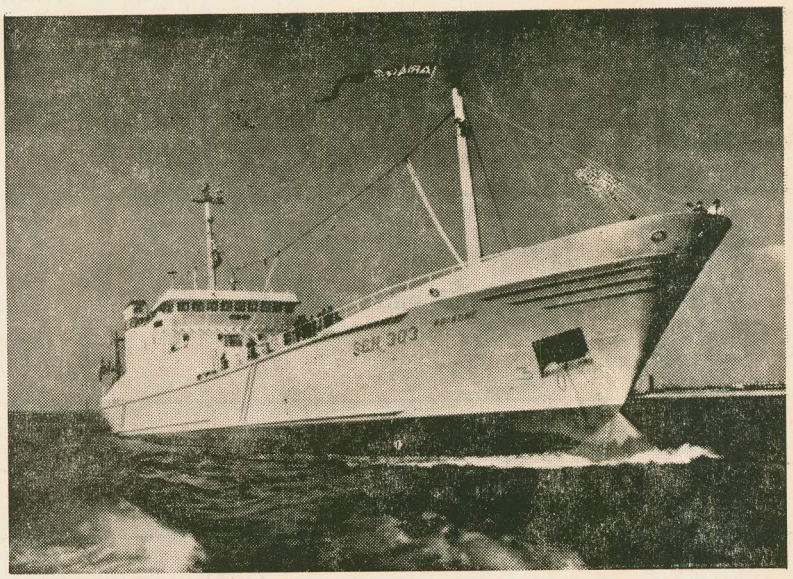
★Prepared by H. Krishna Iyer, G. R. Unnithan, P. Sreenivasa Rao, A. K. Kesavan Nair & R. G. Nair.

Polyurethane Foam as Insulation Material in Ships: High Thermal Resistance, High Compression Strength and Easy to Use.

Because of its high thermal resistance, good compression strength and easy use, rigid polyurethane foam was used for insulating the refrigerated holds in the refrigerated trawler SCH 303-Ariadne.

This ship, which belongs to Redriji W. Van der Zwan & Zn. B.V. of Scheveningen, was commissioned last year and is the Dutch fishing fleet's largest stern trawler. The Ariadne was built by the Ijsselwerf B. V. in Capelle a/d Ijssel.

The polyurethane foam used is formed by a chemical



Because of its high thermal resistance. good compression strength and easy use, rigid polyurethane foam was used for insulating the refrigerated holds in the refrigerated trawler SCH 303 - Ariadne

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Depending on their chemical nature, fats and oils are classified into two groups saturated and unsaturated, and when the degree of unsaturation is more, they are called polyunsaturated fats or oils. A typical example is sardine oil, about 40% of acids in this being polyunsaturated. This is true for most of the fish found along our coast. The nutritive value of fish oils has been fully realised only recently.

The main role of fat (or oil) in food is as a source of energy. Recently it has been found that excessive use of certain types of fat may lead to cardiovascular diseases such as atherosclerosis which is a condition where the blood vessels are thickened by the deposition of a fatty material called cholesterol on their walls, resulting in reduced blood flow. In extreme cases, it causes coronary failures. Extensive investigations on the various aspects of this disease have shown that consumption of saturated fat like hydrogenated oils, coconut oil etc. led to accelerated cholesterol deposition in blood vessels. Unsaturated fats, especially the polyunsaturated fats have got the ability to lower the cholesterol level in blood. Fish oils, with their high degree of unsaturation must, therefore, be capable of controlling blood cholesterol levels.

*

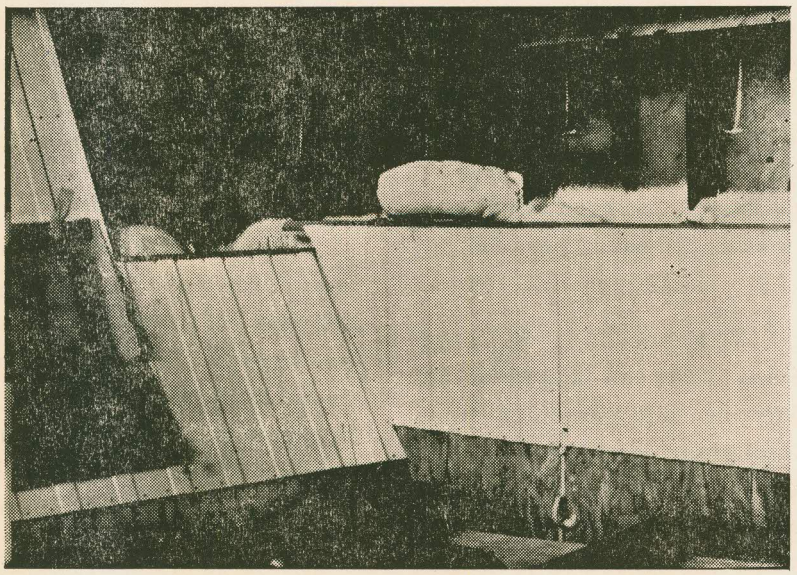
reaction between the polyether-polyol Resinol and the polyisocyanate Urestyl. These two components are produced and supplied by Resina Chemie V. O, F. in Foxhol. The insulation work on board the Ariadne was carried out by C. Kranendonk B. V., Rotterdam. This company is specialised in carrying out in-situ insulation work using the Resinol-Urestyl system.

CARPENTRY AND INSULATION WORK

The insulation work was carried out as follows: First of all a wooden floor was fitted at a height of 200mm above the floor of the hold (in the case of the lower hold this is the top of the tank), and holes were bored in this floor at regular intervals. The mixture of the Resinol and Urestyl components was poured through these holes, thus forming the Resifoam polyurethane foam. Next a wooden structure was erected along the hold walls at a distance of 250mm from the walls, using 1.22m high ply-wood. The polyurethane mixture was poured into the space behind these sheets in the same way.

Finally a horizontal wooden structure was fitted 250mm below the hold ceiling, after which the polyurethane components were poured into the space above these ceiling sheets.

The 12mm thick ply-wood sheets were fastened to 5x5cm timbers. These timbers were mounted on metal strips which were welded to the ship's frame at 60 cm intervals. The sheets used on the floor were fastened to 15x6cm beams which were also mounted on metal strips.



The polyurethane foam used is formed by a chemical reaction between the polyether-polyol Resinol and the polyisocyanate Urestyl.

Another important advantage of polyurethane foam is the product's favourable compression strength (approx) 1kg/cm^2), in contrast to that of materials such as glass wool and rock wool. Using the latter materials would have demanded a much heavier construction to prevent damage resulting from the load shifting in bad weather.

After the carpentry and insulation work had been carried out in the hold, a 3mm thick layer of reinforced polyester was attached to the inside of the walls and on the floor, and was subsequently provided with a top-coat. Finally the entire hold was finished with an odourless and tasteless paint.

HIGH THERMAL RESISTANCE

The insulation thickness varies between 200 and 250mm ample thickness for maintaining an operating temperature of minus 27°C in the refrigerated hold. Of all the well known insulation materials, polyurethane foam has the highest thermal resistance (λ= 0.017W (m. k.).

In the case of the cold storage tanks for temporary storage of fish, the carpentry and insulation work were carried out in the same way, although the walls, the floor and the ceiling were finished with reinforced polyester.

Masters Degree Awarded

The following Scientists of the Engineering Division of the CIFT have been awarded Master of Technology Degree by the University of Cochin.

1. Shii. S. Ayyappan Pillai, Scientist S - 2 and Scientist-in-Charge (Engineering Division) has secured FIRST CLASS with SECOND RANK in Electrical Engineering (Industrial Electronics).

2. Shri. P. K. Chakraborty, Scientist S-2 has secured FIRST CLASS in Chemical Engineering (Project Engineering)

3. Shri P. N. Joshi, Scientist S–I has secured FIRST CLASS in Mechanical Engineering (Engineering Design),

4. Shri. S. M. S. Abuthahir Ali, Scientist S-1 has secured FIRST CLASS with DISTINCTION in Chemical Engineering (Project Engineering).

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The pipelines in the factory area of the ship were similarly insulated with polyurethane foam. First a 2 cm wide 70cm high wooden casing was built around the pipelines runs. After plastic sheeting had been fitted as a vapour barrier, the polyurethane components were poured into the casing and the space around the pipe filled with foam. Finally the wooden casing was finished with a layer of polyester.

Individual pipelines were insulated with double "shells" of polyurethane foam. The insulation was provided with a vapour barrier and finished with polyester.

Both the polyurethane foam supplied by Resina Chemie and the method of application used by Kranendonk have been approved by Lloyds and Veritas. The SCH 303-Ariadne, which has a crew of 26, has an overall length of just over 77m. The ship's hold has a capacity of 1,930m ^{3} and its cooling tanks have a capacity of 1,930m^3 and 150 m^3 respectively.

The ship has a gross tonnage of approximately 1,064 tonnes and can carry 60,000 packs of deep-frozen fish, each pack weighing almost 25kg. It was specially built and equipped for mackerel fishing. For freezing the fish there are 24 frosters on board, each of which can process 50 packs per 6 hours, i. e. 4,800 per 24 hours.

C. Kranendonk B. V. has many years of experience in carrying out carpentry and insulation work on board ships. The company recently carried out insulation work on 14 trawlers the structure of which had been altered. The original Resifoam polyurethane foam (five to ten years old) was found not to have been adversely affected in any way. Because of the high thermal resistance of polyurethane foam Kranendonk was able to achieve a total K- value on all the ships treated of 0.30 W (m^2. K.).

Resina Chemie is a Dutch partnership in which Chemische Industries Synres B. V., Hoek van Holland, has a 75% interest and AVEBE, Veendam a 25% interest.

This undertaking, which incorporates the polyurethane activities of the former Scholten branch of AVEBE, Produces in Foxhol a number of raw materials and components for the manufacture of polyurethane foams and resins.

Source: BETA Public Reations B.V.

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Gleanings from Other Journals

SUBSIDISED INSURANCE FOR SMALL FISHERMEN

The Union Government has sanctioned a centrally-sponsored scheme of subsidising premium up to 50 percent for small fishermen in providing them with an accident inssurance cover.

Announcing this in New Delhi on March 3, '83 at a news conference Mr. S. Chandra, Managing Director, National Federation of Fishermen's Co-operative Limited (NFFCL) said that under this scheme, the balance 50 percent of the premium would have to be provided by the respective state governments, either entirely or in conjunction with fisheries co-operatives.

He said, this subsidy will be available to the members of the fisheries co-operatives alone, which today account for as many as five lakhs.

He said the intention is to rapidly increase the coverage of the insurance scheme to as many fishermen as possible. Since the subsidy will now be available only to members of co-operatives, it is expected that a large number of fishermen will come within the co-operative fold, he added.

— Economic Times

KARNATAKA EFFORTS FOR FOREIGN TIE-UPS IN FISHING

Karnataka, with its long coastline and rich potential in fisheries, is now exploring the possibilities of starting joint ventures with Spain and the Philippines.

A Spanish delegation visited the coastal area on February, '83 and had discussions with the Director of Fisheries, Mr. M. Jayaraj, on deep sea fishing for tuna and squid varieties. The fishing is deeper waters where the two varieties are available, is proposed to be done by charted trawlers as a joint venture involving the Spanish agency and the Karnataka Government.

Agreement with Philippines: The Karnataka Fisheries Development Corporation is negotiating with the Philippines for exporting tuna fish. A deep sea vessel for catching tuna fish will be stationed in the Malpe fishing harbour, if an export agreement is reached as part of the joint venture.

Meanwhile, the Central and State Governments are jointly taking up a survey of the marine fisheries resources in the Karnataka waters. The Director of the Centra Exploratory Fisheries Project and the State Fisheries Director jointly inspected the sites in Malpe for the purpose.

— The Hindu

FISH PRODUCTION CAN BE RAISED, FEEL EXPERTS

Although fish production has steadily been increasing in the past three decades, a vast potential still remains unexploited. The fish catch from the ocean can easily be tripled and that from inland water resources quadrupled, according to experts of the Central Institute of Fisheries Education (C I F E), of Bombay,

The production potential of the Indian Ocean alone estimated at between 11 and 20 million tonnes annually, against the present output of only three million tonnes. The Director of the C I F E, Dr. S. N. Dwivedi, believes that a production level of nine million tonnes should not be difficult to achieve by the turn of the century. The immediate aim, however, should be to double the output in the next five years.

The average annual production of fish from the various reservoirs in the country is at present woefully low-around 10 kg. a hectare. It can be raised to about 40 kg. by the adoption of modern management techniques. The actual potential is indeed much higher, up to 300 kg. in small reservoirs and

Let's Talk it Over

SHRI T. R. SARANATHAN, BOMBAY

Which is the best method of production of Fish meal ?

C. I. F. T. The method of production of fish meal generally followed and more hygienic is the wet proeess, in which all the steps of cooking, drying and powdering are carried out in the dryer itself. The half-tonne-dryer developed at this Institute is based on this process.

Dr. Jacob, V. Cheeran, College of Veterinary & Animal Sciences, Mannuthy.

I would like to know whether fish liver oil needs any antioxidant to prevent rancidity and if so, the name of the chemical and the percentage to be added in the oil.

C. I. F. T. Generally, antioxidants are not added to fish liver oils including shark liver oil for pharmaceutical use. However, the common antioxidants used to treat fish products against rancidity are ascorbic acid, citric acid, BHA & BHT. The percentage used varies from 1 to 2 by weight.

Director, Integrated Fisheries Project, Cochin

I would like to know the details of species-wise requirements of storage temperature for different types of frozen fishery products like shrimp, sardine, tuna, cuttle fish, froglegs, lobsters etc.

C. I. F. T. The storage temperature of any frozen fish is-25°C. □

Doctorate Awarded

Shri. P. G. Viswanathan Nair, Scientist of C. I. F. T., Cochin, has been awarded Ph. D. in Biochemistry by the Kerala University. Guided by Dr. K. Gopakumar of CIFT, Shri Nair studied on the composition and hypocholesterolemic properties of fish lipids.

CIFT Technology Adopted

M/s. Taj Seafoods, Cochin, have successfully adopted for commercial production the technology of Natural Pack for canned sardines developed by the CIFT. Their products manufactured on this technology is reported to have gained popularity in North East India and elsewhere in the country.

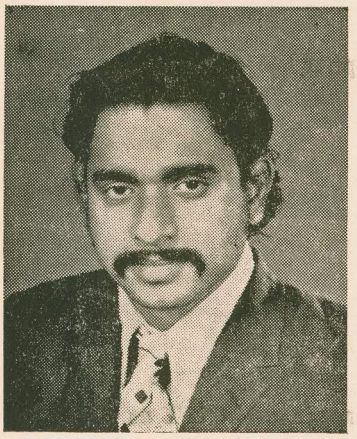
about 100 kg. in medium reservoirs.

If the optimun productivity level is achieved. the estimated three million hectares of reservoir waters available in the country can produce nearly 1,20,000 tonnes of fish annually valued at about Rs. 60 crores. Besides augmenting the availability of the protein-rich food, it can provide employment to nearly 72,000 fishermen, it is estimated.

— Times of India

Meet Our Scientists - 24

T. K. SIVADAS



Shri T. K. Sivadas born on 7–10–1938, now working as Scientist-in-Charge of Electronics & Instrumentation Division, passed M. Sc. Physics with Electronics and joined CIFT in 1963 after a short period as lecturer in a College. He started his carrier in CIFT connected with problems in marine engineering. He has developed quite a number of instruments and devices for a variety of fields connected with sea particularly to fisheries and oceanography. Out of the three dozens of instruments developed by him, some have been commercialised and are being used by different departments in the fields of fisheries, oceanography, port and harbour, water resources management, off-shore oil prospecting, coastal engineering, environmental monitoring etc.

He has received National Invention Awards on Republic Day 1971 and Independence Day 1976. He has been nominated to the Panel on Marine Resources Survey Instruments of National Committee on Science and Technology He has received advance training in Acoustical Methods of Fish Detection and Resources Assessment organised by FAO/NORAD in 1973.

His specific contributions to fisheries technology are about 2 dozens of electronic instruments and an appropriate methodology for their application in the fields of fishery hydrography, commercial fishing, testing and standardisation of fishing gear, behaviour studies of marine animals, quality control and automation in fish processing, for the purpose of accelerating the R & D efforts, investigations, explorations and commercial activities in those lines more scientifically and efficiently.

He joined National Institute of Oceanography in 1974 where he could broaden his activities and gain wider experience in oceanographic instrumentation, which enabled him to develop a few oceanographic instruments. During this time he carried out special assignments and participated in the bottom pipe line survey work done by N. I. O. in 'Gaveshini' for ONGC, as the Scientist-in-Charge of instrumentation aspects of the project. He was also in charge of the design and construction of buoys, platforms etc. needed for the installation of the meteorological and oceanographic instruments in connection with the survey work done in 1976 in Bombay–Thana Geck as part of waste water disposal programme of Bombay Muncipal Corporation. He was deputed to Norway in 1976 for acquiring instruments and getting training in their operation for developing the ocean engineering activites of N. I. O. During this time he visited several R & D institutions and factories in Europe manufacturing marine equipments and got training in their operation. He also utilised this opportunity to design and develop a ROP (Rate of Penetration) meter for use in floating oil rigging platforms, in collaboration with the Institute of Port & Harbour and Institute of Petroleum Engg. The equipment was later installed on the model rig

CIFT Appointments, Promotions etc.

Appointments

Shri A. George Joseph, Jr. Clerk Appointed as Assistant

Shri A. Anil Kumar, T-2 ,,

Smt. N. K. Saraswathy, Jr. Stenographer Appointed as Stenographer

Shri Y. Philipose, Jr. Clerk Appointed as Senior Clerk

Smt. M. A. Prasanna, Jr. Clerk ,,

Shri K. K. Sasi joined CIFT as Jr. Stenographer

Shri K. Venugopalan Joined CIFT as Jr. Stenographer

Shri R. Viswanathan, Jr. Clerk Appointed as Senior Clerk

Shri T. S. Gopalakrishna Iyer, Scientist S-2 of Bombay Research Centre joined CIFT as Scientist S-3

Transfer

Shri N. Subramanian, Technical Assistant of CIFT transferred to IIHR, Bangalore.

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available in the Institute of Petroleum Engg. in Norway. During this period he got Diploma in Marine Instrumentation from University of Trondheim, Norway.

His expertise in marine instrumentation has been utilised by other departments also. A large automatic Coastal Oceanographic Data Acquisition System (CODAS) designed by him for Centre for Earth Science Studies is now in operation in Aleppey acquiring data in 16 channals from remotely operated sensors, providing useful informations for investigations in many fields connected with coastal erosion studies, Port and Harbour development, coastal fisheries, oceanography and meteorology. Another large automatic data acquisition system developed by him is working continuously in the very hostile and hazardous environment on the floating American oil rig SEDCO 445 working for ONGC in Bay of Bengal, providing marine enviromental data needed for the oil prospecting activites. A net work of tide and wave telemetering stations have been installed at 5 ports alone the western coast of the country which are working continuously for the last 3-4 years based on the technology developed by him, providing ensrmous data needed for coastal erossion protection measures and Port and Harbour developments.

He has got 42 publications and is a member of several professional societies connected with fisheries, physics, acoustics, instrumentation and underwater technology. □

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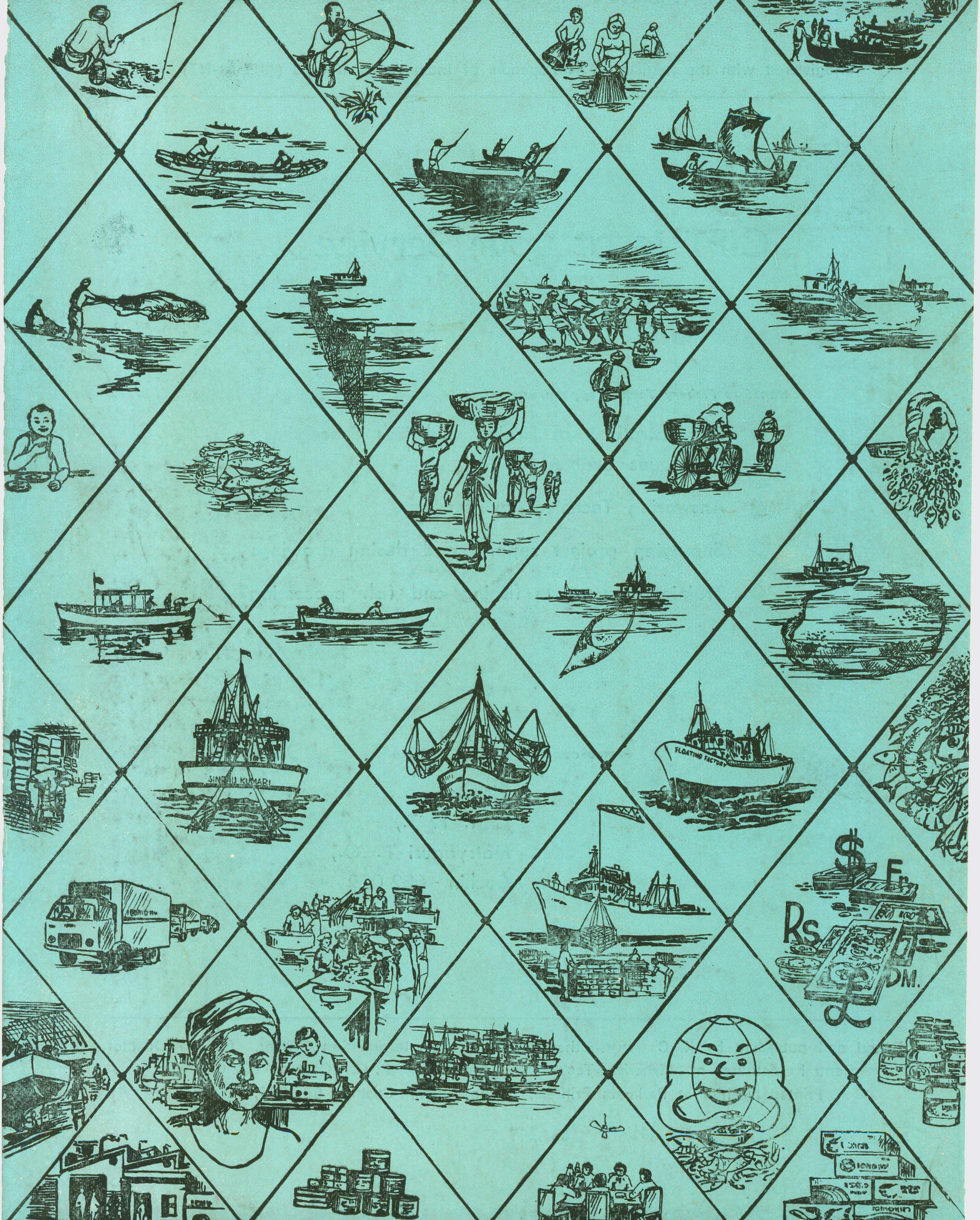
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