Fish technology newsletter

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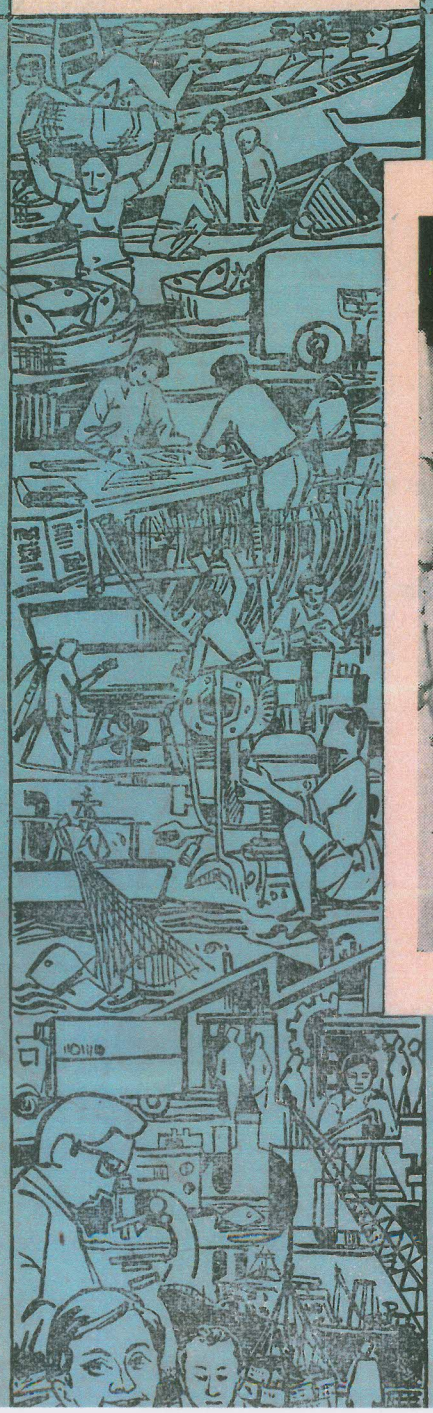
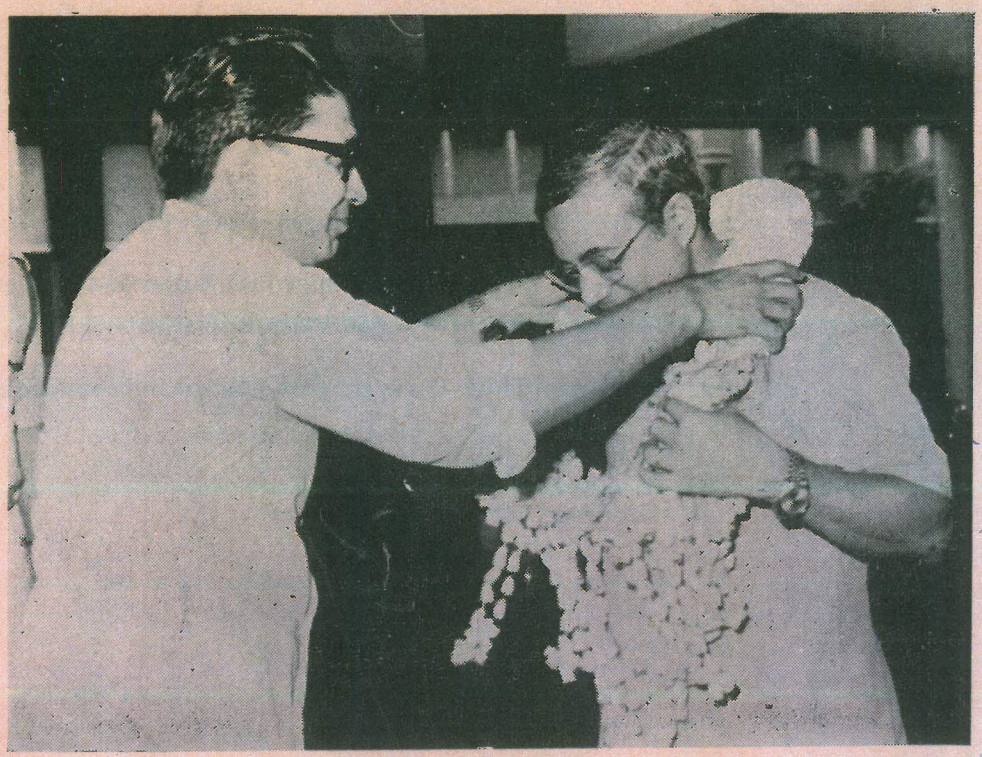




Mr. Abdul Gayoom, His excellency the President of Maldive, visited CIFT on September 11, 1983. He is being garlanded by Dr. R. M. Acharya, Deputy Director General of ICAR — Report on page 4.

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

Model Layout of a Fish Processing Plant*

Even though several methods of preservation have been employed such as dehydration, curing, canning, freezing etc., the freezing preservation of fish has been more popular because the frozen product is subject to least change of quality and shape compared to all other methods of preservation. Of the total export of marine products from our country the frozen products constitute more than 70%.

There are several fish freezing plants of different capacities in our country, and it cannot be said that they are all designed properly. Depending upon the availability of land and the machinery, fish freezing plants with cold storage facilities have been set up. Several requests are received by the CIFT to prepare and supply designs or lay out of a fish freezing plant. After studying the various requirements of a freezing plant of medium size, it has been observed that an economically viable plant should have a capacity of processing about 2 tons finished product per day. Plants of higher capacities such as 4 tons or more can also be considered as viable propositions, Hence, design of a 2 ton plant has been taken up, and the infrastructural requirements have been worked out as follows.

Raw material requirement

In order to produc 2 tons of finished product, 4 to 5 tons of raw material is required. As the raw material may have to be stored for about 5 days in ice before processing the raw material, storage should have a capacity of about 25 tons As the raw material has to be stored in ice, the total storage capacity of fresh fish storage should be 50 tons (25 tons fish and 25 tons ice).

Ice requirement

As it is envisaged to process 5 tons of fresh fish every day, the production capacity of the ice plant should be 5 tons. A 5 tons per day production capacity can be selected. As the ice requirement for the use of fresh fish storage has been fixed as 25 tons at a time the ice storage should have a minimum of 25 tons capacity. During the peak seasons, the plant may have to process very large quantity of fish. In such situations, the above capacity of ice storage may not be suificient. Hence the ice storage capacity has been fixed at 60 tons.

Freezers

The lay out is for freezing 2 tons of finished product per day. The freezer proposed is a double contact plate freezer containing 7 freezing station each station holding 20 blocks of frozen block of 2 2 kg. (5 lb).

Cold Storage

Cold storage should have a capacity of storing the production of a month. As such the capacity should be at least 60 tons.

Water requirement

The quantity of water required for the whole processing operation is estimated to be 10 to 12 litres per kg. of fish. In order to process 5 tons of fish, the water requirement will be 60,000 litre/day. Moreover water is required for ice also i. e. 5 tons or 5000 litres. Hence the total requirement of water will be 65,000 litre/day.

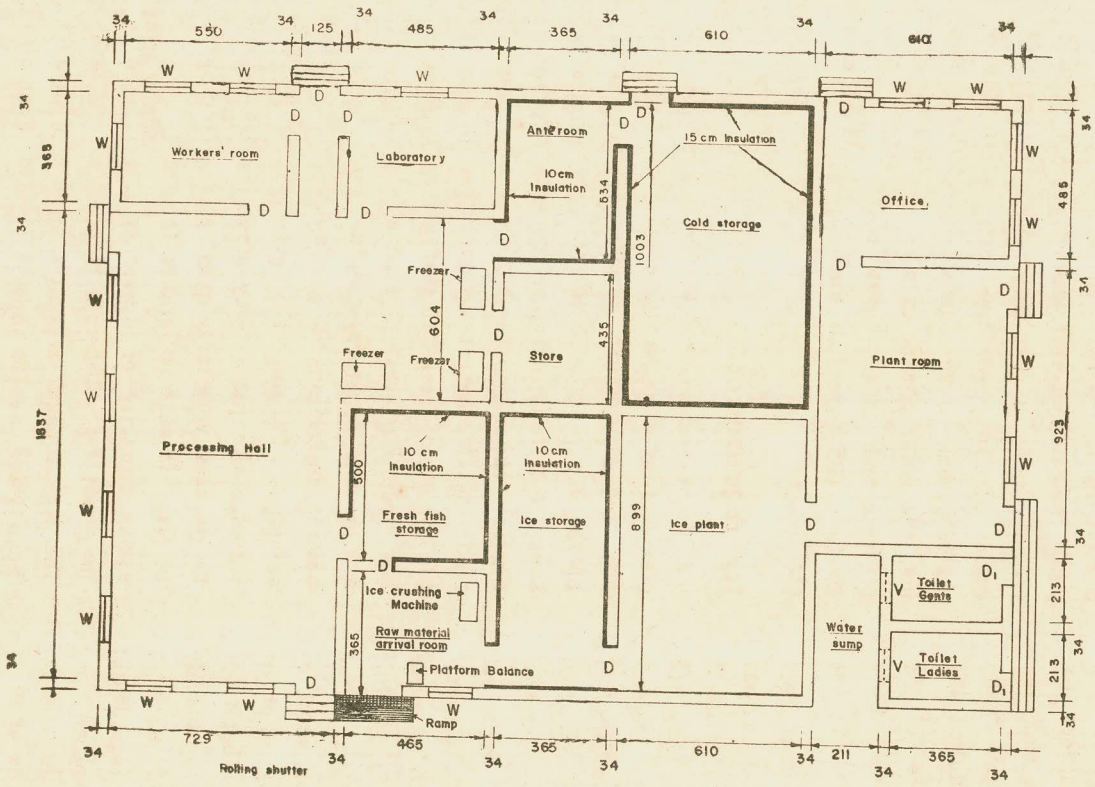
Taking into consideration of all the requirements mentioned above the plant lay out is prepared as listed below:

Raw material arrival room

Raw material arrival room with 3.65 x 4.65 metre area has been provided with a platform balance for weighing the raw material and an ice crushing machine for crushing ice after drawing from the adjacent ice storage. The ice fish mixture

LAYOUT OF A FREEZING PLANT

CAPACITY - 2 TONS PER DAY



CENTRAL INSTITUTE OF FISHERIES TECHNOLOGY				
SCALE 1cm = 1m		ALL DIMENSIONS IN CM		
DESIGNED	DRAWN	TRACED	CHECKED	APPROVED
SAQ		SAQ		SAQ
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can immediately be transferred to the adjacent fresh fish storage room.

Fresh fish storage

Fresh fish storage room with 5 metre x 4.65 metre area has been provided adjacent to the raw material arrival room and the processing hall. The fresh fish storage has to be insulated with 100 mm. thick thermocole or any other insulation. The capacity of the storage is about 50 tons (25 tons fish and 25 tons ice.)

Processing hall

The processing hall with 15.37 metre x 7.29 metre area is quite sufficient for processing 5 tons of fish per day. The area wlll be sufficient for processing even double the quantity whenever such occasion arises.

Freezer space

An area of 6.04 metre x 4.85 metre has been set apart for installing the freezers. For freezing 2 tons/day of finished product, 1 freezer will be sufficient. However in the lay out three freezers are shown so that in case of necessity the capacity can be increased to 6 tons per day by installing additional freezers.

Store

The store area indicated is quite small viz. 4.35 metre x 3 65 metre which is meant mainly for storing the cartons. The vacant freezer area can also be used for storing such items like freezer trays, utensils etc.

Ante room

An ante room of 5.34 x 3.65 metre area has been provided so that the cold storage is not directly open to the ambient temperature conditions. The ante room has to be insulated with 100 mm. thick insulasion.

Cold Storage

The cold storage with 10.03 metre x 6.10 metre area has to be insulated with 150 mm. thick insulation and has got a capacity of storing 60 tons finished product which serves the purpose of storing one month's production. The door provided outside is not meant for frequent opening. It is meant only for directly loading to the Refrigerated/ insulated truck from the cold storage.

Ice Plant

The ice plant room with 8.99 metre x 6.10 metre area is quite sufficient to produce 5 tons per day. It has been provided by the side of the ice storage on one side and the plant room on the other side so that the operation is quite convenient.

Plant Room

The plant room with 9.23 metre x 6.10 metre is meant for housing all Refrigeration machinery such as the compressor, condenser, circulating water pump, pump to lift water from the sump to the overhead tank etc. The height of the plant room should be more than that of other rooms: that is, it should be at least 4 metre whereas the height of all other rooms need be about 3 metres.

Apart from the major areas mentioned above, the general requirements such as office, workers' room, laboratory, water sump, toilet for gents and ladies etc. have been marked.

The total plinth area works out to 597.8 sq. m. It has to be mentioned that the specifications given in this lay out is not so rigid. Depending upon the availability of space and site conditions the arrangement as well as area allocations can be varied.

The compound should have sufficient space round the building to meet the specifications of the Municipality / Corporation / Health authorities, sufficient space for installing cooling tower for the refrigeration system, overhead tank for water storage, additional toilet and urinals separately for gents and ladies etc. There should be roadways for taking in trucks and refrigerated trucks both for transporting raw material and frozen products. □

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*Prepared by Shri S. Ayyappan Pillai, Scientist-S2 (Engineering)