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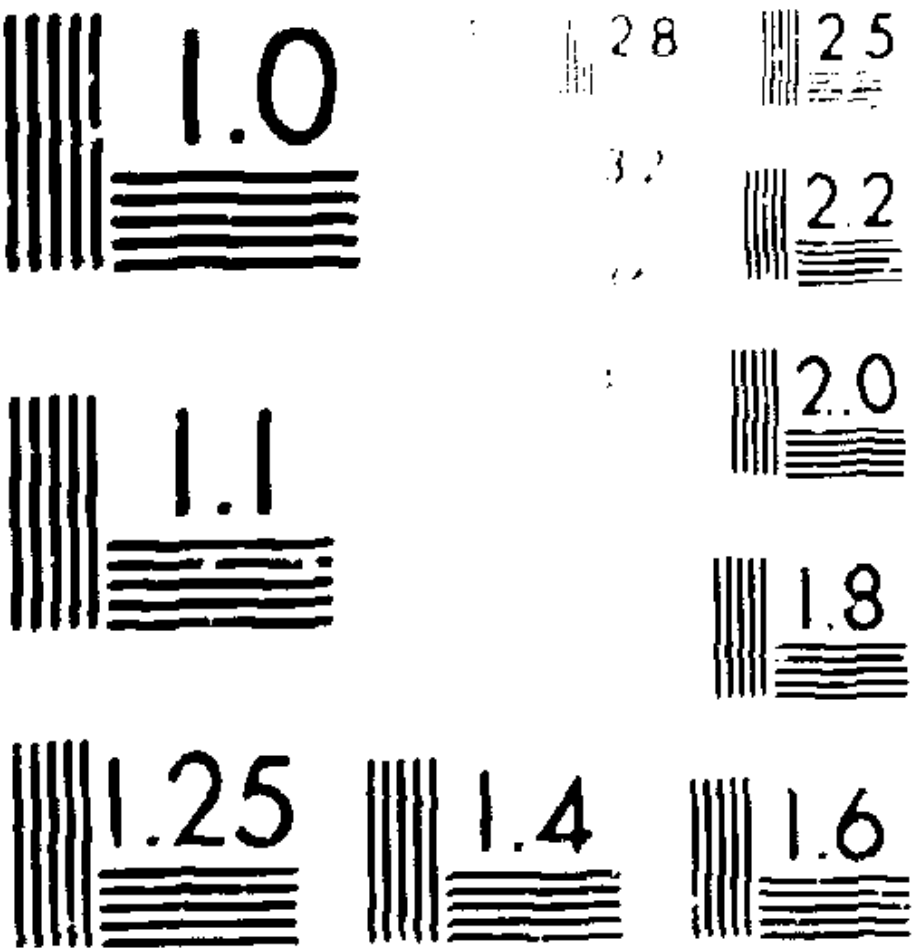
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WAYS AND COOPERATION PROCEDURES FOR DEVELOPING SHIPYARDS AND MIXED ENTERPRISES TO ENSURE THE VOLUME OF SHIPS REQUIRED BY THE AREA*

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* The views expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO.

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WAYS AND COOPERATION PROCEDURES FOR DEVELOPING SHIPYARDS AND MIXED ENTERPRISES TO ENSURE THE VOLUME OF SHIPS REQUIRED BY THE AREA

During the period 1962 - 1972, with the growth in importance of the pilchard, the fishing boat building industry developed in Peru. The industry, closely related with shipyards, concentrated its efforts on the building of fishing boats ranging in size from 40 to 350 metric tons with hatch space lengths of 40 to 121 feet. In the development of this industry 17 private shipyards took part specializing in the building of various types of fishing boats using different materials for different kinds of hulls: 9 shipyards made steel hull boats, 5 shipyards made wood hull ships, 1 built fibreglass hulls and 2 manufactured a mixture (iron hulls, wood and/or fibreglass).

The activities carried out during this period resulted in the building of approximately 1,500 pilchard net fishing boats with hatch capacities of 90, 100, 120, 140, 180, 270 and 350 metric tons.

Legal issues during 1973 resulted in a ban being placed on further building and the growth of the fleet was suspended because of the excessive amount of hatch space already in existance. Nevertheless, the building of new export type fishing boats and the re-equipping of existing ones was permitted.

During 1974 and 1976, after the Government takeover of the fishing industry, the fleet consisted of 1,154 boats, with a total hatch capacity of 216,531 metric tons. After an evaluation of the sale of boats to national shipowners a total of 853 were made available for indirect human consumption in the fishing of pilchard. Of these, 513 units had hatch capacities ranging from 180 to 350 metric tons with a total of 133,650 metric tons.

The rest of the fleet, formed by 340 boats ranging in hatch capacities from 90 to 350 metric tons, with a total capacity of 42,121 metric tons, were sold as surplus fleet and were used for the direct fishing of other species.

Bearing in mind that in Peru there are species such as "jurel", "la caballa", "shark", "squid" etc., which have not been fully exploited, and

considering that a surplus of hatch capacity still exists in both direct and indirect human consumption fleets, some projects have been started for diversification in fishing methods with the aim of encouraging such fishing systems as "half-water trawling", "trotline", "lightshining fishing", etc.

There is a need to furnish the shipyards or beachyards with machinery, equipment, materials, space and specialist technical staff.

Artisan Fishing Fleet

The latest census has estimated the fishing fleet at 4,489 boats. These artisan boats, built of wood and constructed at small shipyards or shops at northern ports, are operated along traditional lines where the shipowners and their relatives act as crew members. The boats have hatch capacities of one to 30 metric tons, the larger number ones ranging from 2, 3, 5, 8, 15 and 20 metric tons of hatch capacity.

According to a survey carried out at coastal level, there are 2,679 local curtain boats, 1,118 "pinteros", 235 seafood catchers, 16 trawlers with fixed-mouth nets and 441 "rounding up" boats. The latter are boats which usually have an engine, but they do not include the 2,500 units formed by rafts, small rafts and straw horses.

These units are the main providers of fresh fish for human consumption.

By cooperative agreements 29 new artisan boats have been built with "rounding up" nets and are of 15 and 4 metric ton capacities and include 5 minor shipyards.

In view of the excessive "rounding up" fleet a project to hydromechanize the artisan boats making them more effective with "curtain style" rigging, "long line" and "lights fishing" for the squid, is under consideration.

INTRODUCTION

The fishing industry in Peru has developed structurally and in size according to the limitations imposed on it by the physical appearance of its coastline which extends some 3,079 kms. That is why within the period 1962 - 1972 the pilchard industry became so important, particularly where quantities of 20 million tons of biomass contributed to the speedy development of both the fish meal and oil industries which go toward forming the infrastructure of the plant and fishing fleet levels.

The fishing boat shipyard industry had an important role to play in the designing and building of "rounding up" fishing boats which were being built on a larger scale all the time to satisfy demands. A production level of 1500 fishing boats ranging in size from 90 to 350 metric tons of hatch capacity led to the installation of 17 private shipyards, most of them concentrated in the port of Callao because of the ease with which materials could be obtained. These shipyards specialized in the building of several types of boats of several hull materials such as wood, steel and fiberglass.

This growing fishing fleet required the building and operation of 11 shipyards and 3 floating dry docks to provide both preventive maintenance services and corrective ones to the fishing fleet at a shoreline-length level, eventually giving way to developing of a work force possessing quality and know how in all aspects.

Due to the excessive numbers of pilchard caught (more than 10 million ton catches per year) and because of the oceanographic changes of 1972, the pilchard fishing industry collapsed leaving behind an under-used and over-sized fishing fleet.

In 1973 the building of "rounding up" fishing boats for pilchard was banned, with the exception of those meant for the export market and those destined for use in fishing for direct human consumption. Eight shipyards were able to export 109 new units with iron hulls ranging in size from 30 to 350 metric tons with hatch capacities equipped with "rounding up" and trawling systems (shrimp and fish catching).

Nevertheless, in 1980, parallel to the trend of diminishing pilchard schools, there was a noticeable increase in other species such as "sardine", "jurel" and "caballa."

Consequently, a great part of the effort made in fishing the pilchard fleet has been re-directed towards the sardine source, a species which, because of its tendancy to move in schools or shoals, imitates the behaviour of the pilchard.

To avoid overcatches of hydrobiological sources by an oversized fleet formed of 340 boats which are considered surplus, decrees have been issued to improve the storing conditions of the boats and avoid the situation where the raw material, because of its low quality conservation properties, is used in fish meal manufacturing.

It was therefore necessary to standardize the fishing activities, especially those concentrating on direct human consumption, through the introduction of a "Rationalization Plan" which allowed fishing tasks to be performed by boats converted with isothermic hatches or those which possessed some other system of conservation.

Faced with this new line in the Peruvian fishing industry it is now the turn of the shipyards, beach-yards and floating drydock barges to up-date their facilities to meet the demands of fisning for direct human consumption by using different fishing styles.

Mention should also be made of the artisan fishing industry which is providing vast quantities of fresh fish for direct human consumption. This fleet numbers 4,489 units and consists of boats built predominately with wooden hulls constructed at small shipyards located along the coasts. Hatch capacity ranges from 1 to 30 metric tons and they are rigged with "curtain", "spiral", "rounding up nets" etc.

In line with this kind of fishing projects have been carried out aimed at encouraging technical backing to increase production.

FISHING FLEET

BACKGROUND

During 1962 - 1972, when there was a high level of pilchard production, the shipyard industry developed building approximately 1,500 boats at 17 shipyards. Most of these were of the "rounding up" system with hatch capacities of 90, 100, 140, 180, 270 and 350 metric tons.

With the diminishing of the pilchard stocks the fleet became oversized and underused. After the Government takeover in 1974-1976 the fleet consisted of 1,154 units. The sale of 853 units to private shipowners was authorized. 513 units, ranging in hatch capacity from 180 to 350 metric tons, were sold for the exclusive fishing of pilchard or for indirect human consumption and 340 units were sold as surplus for the extraction of hydrobiological sources for direct human consumption.

The rest of the fleet, consisting of 301 units, was sold abroad or was written off as being obsolete, or was dismantled.

When the building of fishing boats for the extraction of pilchard was stopped there were few shipyards which remained open. During the fishing crisis, 8 shipyards and small beach-yards, some shipyards concentrating on the building of new units, were able to export 109 boats ranging in size from 30 to 350 metric tons. These boats were designed for fishing in the trawling system (shrimps and fish) and some were fitted with "rounding up" nets. Other shipyards and beach-yards started maintenance work such as careening etc. Others diversified their interests to include the metal mechanic industry, thus maintaining a work force which possessed technical know how.

The fishing fleet can be categorised as follows: the direct human consumption fleet (units dedicated to providing canning plants and the trawling system of fishing for shrimp and fish); the indirect human consumption fleet (consisting of small enterprises for extraction of pilchard PEEA's) for supplying the fish meal plants; the artisans' boats and finally the high sea fleet or trawler factory ships.

For the purposes of this report the first three categories will be outlined:

Direct Human Consumption Fleet

After the Government takeover of the fishing industry, and the transfer of the ex-pilchard fishing boats by direct sale to private ship-owners, an unusual increase in the fleet for direct traditional human consumption took place. This resulted from the inclusion of 340 boats which had been declared as surplus, their hatch capacities ranging in size from 90 to 350 metric tons with a total capacity of 42,121 metric tons.

This uncontrolled increase of the fleet resulted in exploitation of the hydrobiological sources, especially that of the sardine which, when caught and packed in the same hatches that stored pilchard, increased the catch percentage in bad conditions leading to the overstocking of the fish meal plants at the canneries.

Faced with this situation in September 1980 a "Rationalization Plan" was applied to 289 boats: 186 having iron hulls, 103 with wooden hulls and the remainder ranging in size from 100 to 140 metric tons.

In 1981 there was a large number of units capable of operating effeciently ie. 310.

75% of the fishing fleet has a lifespan of between 10 years and 20 years, the age of the hull and the general condition of the motor being the determining factors.

The aim of the "Rationalization Plan" was to get the maximum benefit from the catch and to encourage the conversion or adaptation of the vessels for defining priorities within the various fishing tasks.

As a result of the measures taken during the first semester of 1982, a fleet of 302 boats was rigged and equipped with the following systems:

- 10 boats with refrigerated seawater R.S.W.
- 129 boats with cooled seawater system C.S.W.

- 63 boats with hatches with isothermic lining.
- 31 boats do not have re-conditioned hatches; nevertheless, they do operate with boxes and ice.
- 69 boats are out of operation (24) and without the use of boxes (45)

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A study of these figures shows that the conditioned boats represent 70% of the fleet in 1980 and 67% of the fleet in 1982.

Attention should be drawn to the conversion of 25 vessels equipped with trawling rigs by stern and with isothermic hatches ranging in size from 50 to 200 metric tons.

Indirect Human Consumption Fleet

The pilchard catching fleet belonging to "small pilchard extraction enterprises" was formed by 513 boats ranging in size from 180 to 350 metric ton hatch capacity with a total hatch capacity of 133,650 metric tons. 88% of the fleet had iron hulls, 0.9% had wooden hulls and 2.2% (11 units) had fibreglass hulls.

At present, 361 vessels are in operation. Nevertheless, a substantial part of this fleet (63%) was built before 1970.

Because the pilchard industry is governed by strict regulations, and because of the biological population collapse, the fleet works only a limited catch, which is why it is imperative to the survival of the fleet that it be encouraged to diversify its interests to become more profitable.

A large percentage of this fleet has a hatch capacity in excess of 250 metric tons but despite radar, sonar and ecosound they lack the necessary technical conditions to fish further than the 40 nautical miles limit.

These boats also lack the implements and equipment necessary for conservation and adequate rigs for fishing the direct human consumption

species of "jurel" and "caballa" which are more abundant and are the least exploited. By their very nature these fish are found far from the coast which is why these boats require rigging which will enable them to fish using the trawling system of "halfwater".

This fleet, because it consists of relatively new boats with larger tonnage, is the one which has the best chance of viability for conversion and orientation towards the fishing of other species existing in greater numbers. They will help in diversifying the fishing activity with deep water trawlers with nets and half water ones, long-line fishing and light shining for the squid.

According to an evaluation, the best boats can be considered as those of 350 and 270 metric tons since these have better hulls, are newer and are rigged better. Because of their size they also encourage the use of the refrigeration system.

The shipyards must adopt a series of modifications, especially regarding propulstion systems, structure fishing rigging and equipment.

The objective of these modifications would be a gradual change in the direct human consumption fleet.

In the survey for diversification or re-equipment of the fishing boats the current infrastructure of 8 shipyards, which kept operating during the fishing crises and are still in full working order, were able to export 109 new fishing boats ranging in size from 30 to 350 metric ton hatch capacity.

In September 1980 a "Rationalization Plan" was started for 289 boats to re-equip their hatches in line with the technical norms approved for such a purpose. Through the services of 4 shipyards and flat floating barges, 10 boats have been re-equipped with refrigerated seawater systems "RSW", 129 boats with a seawater system cooled with ice "CSW", 63 boats with isothermic hatches for the use of boxes or in bulk, representing 70% of the total fleet and equipped with rounding up nets of 38 mm mesh for the sardine fishing used in the cannery industry.

In relation to the artisan fishing, there are 4,489 fishing boats in Peru ranging in size from 1 to 30 metric ton hatch capacity. These have been built at small shipyards or boatyards along the Peruvian shores.

Through governmental "cooperative and credit ways" artisan fishing boats are being built out of which 29 are of 15 metric tons and 4 are of 4 metric tons.

Surveys have also been carried out to hydromechanize a group of smaller fishing boats with equipment and gears for fishing with systems such as "long-line", "curtain" and "squid" fishing.

We can thus anticipate the experience and labour force required for the building of ships to satisfy the needs of the Peruvian fishing industry in the near future.

CONCLUSIONS

1. The rise in popularity of the pilchard gave birth to the fishing boat building industry and related industries. 17 shipyards, 11 small beach-yards and 3 floating dry docks built boats ranging in size from 90 to 350 metric tons and provided preventive maintenance services and corrective ones to all those boats.

2. The boats which proved most successful were those built with iron hulls which meant 65% of the production market in relation to the total of "rounding up" boats built.

3. During the fishing crisis only 8 shipyards and 7 beachyards remained in operation concentrating their efforts on the building of new boats for exporting (109 units). Others concentrated on the development of careening whilst many other shipyards diversified their interests to the metal mechanic industry thereby retaining the specialized work force with its technical "know how".

4. The fleet surplus, aimed at direct human consumption fishing, is formed by groups of boats built in 1963 and 1967, many of them re-built in spite of the fact that after 10 years depreciation increases. 187 units were conditioned in the "rounding up" style and 29 units were equipped with trawling nets.

5. With the introduction of the "Rationalization Plan" the exploitation of the hydrobiological sources was controlled, as in the case of the sardine.

   With the participation of the shipyards, beachyards and floating barges the success of the "Rationalization Plan" was possible. It resulted in the reconditioning of 70% of the 1980 fleet and 67% of the fleet in the first semester of 1982. All were fully rigged and equipped with nets for sardine of 38 mm of mesh.

6. It will be ncessary in the future to establish the lifespan of a fishing boat to avoid the re-building of obsolete boats.

7. The pilchard fleet is formed of more up to date boats but is still over-sized in relation to the supply it is fishing. It has therefore been necessary to make studies to re-conditon and rig these units and dedicate them to the catch of under-exploited sources such as the "jurel" and the "caballa" which are difficult to fish with "rounding up" nets because they live far from the coast. It is necessary to rig the boats with equipment of a more diversified type such as trawling nets (bottom) and half-water, long line and lights-fishing for the squid. For this conversion the participation of shipyards and the application of specialized techniques is necessary.

8. The re-conditioning of the pilchard catching fleet would be made in such a way that it would progress the older fleet which is dedicated to direct human consumption fishing.

9. After the census taken amongst the artisan fishing it was found that 4,489 units operated along the whole of the Peruvian coastline. Technical advances have been kept at a standstill, however, thus there must be an introduction of new techniques, financial aid for modern implementation of hydraulic equipment to recuperate "curtain style" fishing nets and mechanization for the "long-line" fishing style.

10. New projects for the artisan fishing industry have been suspended which means that the increase of "round up" boats has created a fleet which is oversized.

11. It is necessary to design a fishing boat of a type and versatility which is in accordance with the realities of fishing in both the industrial and artisan sectors.