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PRESENT STATUS AND PROSPECTIVES OF THE FISHERY INDUSTRY IN LATIN AMERICA

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The Secretariat wishes to transmit the attached report which has been prepared by the FAO Secretariat.

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FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

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Symbols used in tables

-	Nil, zero
ϕ	Negligible
...	Not available
*	Estimated

FOREWORD

This paper contains an interpretation and compilation of facts and data which have been made available to FAO through the work of experts in the field or by information supplied by the countries themselves. It is not written as a result of original research carried out in the region. Many of the original sources of information have not yet been published and are contained in reports submitted to FAO by ETAP experts working in the region and by the Fisheries Regional Office for Latin America in fulfilment of their regular duties.

Among the very few contributions which have been published recently on the problems of economic development of the fisheries in Latin America, special mention should be made of a paper published in the FAO Fisheries Bulletin, Vol. 4, No.3, May/June 1951, under the heading "Better Utilisation of Fisheries Resources in Latin America" by Dr. B.F. Osoric, FAO Fisheries Officer for Latin America.

The statistical tables appended to this report in most cases represent a first attempt to correlate the data available in national publications in a form which facilitates the overall interpretation of the problems of the region. A few tables, such as the one on investments and utilisation of catch, are mainly the result of estimates based on the careful assembling and checking of several sources of information and calculated by several independent processes so as to ensure that the final figures are as reliable as possible within the limits of present resources. Nevertheless, they can and will be subject to revision as soon as more reliable data are made available to FAO. It is hoped that any discrepancies which may be found in these tables will, by themselves, constitute the best incentive for further research in a field which, although of primary importance for the interpretation of the fisheries in the region has, in many instances, been left out of any official or private programme of research.

A. PRESENT STATE OF THE FISHERY INDUSTRY

1. Introduction

Latin America includes twenty countries which differ widely in resources, standards of living, stage of development and economic potentiality. In 1949 it was estimated that 1/ 4 out of 15 of these countries where investigations were made had an annual average per capita income under U.S.$ 100; eight were between the U.S.$ 100 and U.S.$ 300 per capita income brackets. The remaining three countries had U.S.$ 300-500 per capita, i.e. a per capita income of 30 to 50 per cent of that of the United States.

The wide range of economic development found among the Latin American community of countries is reflected directly in the state of the industrial set-up which characterises the region. The importance of the primary occupations (agriculture, forestry and fishing), compared with the secondary occupations (manufacturing, mining and construction) and tertiary (trade and sciences) occupations differs greatly from one country to another. For example, the share of national income contributed by agriculture (including fisheries) is over 40 per cent in Colombia and the Dominican Republic, 33 per cent in Peru, 20-25 per cent in Mexico, Argentina and Puerto Rico, 17 per cent in Chile and 10 per cent in Venezuela. There are no estimates available for fisheries which could facilitate an evaluation of the importance of this section of primary production within the wide field of food producing activities, but while agriculture's percentage contribution varies considerably, it is felt that the contribution which fisheries provide varies even more from one country to another.

1/ National Income and its Distribution in Under-developed countries. U.N., New York, 1951.

It is against such a background of national economies revealing important discrepancies in their composition that an appraisal of the state of fisheries in the region has to be considered. Like any other economic and social process, fisheries involve natural resources, equipment and manpower, but differ from any other economic process, including agriculture, because of the unpredictable fluctuations in, and inadequate knowledge of, the natural resources, and the instability which these fluctuations create for the people involved. The fluctuations encountered in yields from the fishing grounds are immediately reflected in the fish supply situation at the markets and have a considerable effect at all stages of fish handling, processing and trade; they cause fluctuations in the prices obtained by the fishermen and to a certain extent also create confusion with respect to the price which the consumer has to pay. Moreover, the uncertainty created by the fluctuations in fish supplies is a deterrent to the development of fish consumption habits and a pattern of fish demand. For the labour involved fluctuations in the occurrence of fish create periods of idleness and lower the level of earnings. Finally, they weigh heavily on the costs of production and distribution owing to the heavy capital investment required for storage facilities, special transport and market outlets to handle such perishable food as fish. This feature of high instability in fishing might be taken to mean that in the case of fisheries, possibly more than in any other field, sound economic exploitation depends on the existence of high levels of capital investments and the application of efficient technological methods to catching and marketing. Adequate adjustments to natural fluctuations of such a wide range and seasonal importance as the ones found in fisheries can only be made through an efficient use of technology developed in a highly industrialized society.

It might further be said that a fishery cannot spring into being fully grown, cannot even start developing, unless there is a favourable environment. Experience has shown that the rate of growth of a fishery depends largely on the development of supporting industries. Wherever a fishery is under intensive exploitation by large fleets of fishing vessels and highly qualified crews it will be found to comprise adequate facilities for construction and repairs, harbour accommodation and maintenance, and an extensive secondary industry comprising machine shops, fuel tenders, freezers, salteries, canneries, net and twine manufacturers and dealers in all kinds of fishing equipment.

Developing the fisheries industry to its full capacity is a process that calls for well developed business management in handling and trade and technological standards which only a highly developed economic structure can normally support.

The problems of the Latin American fisheries, to be well understood, have to be analysed in the light of this general principle. We can never expect to find a highly developed state of exploitation of fishery resources in countries where the economic structure still fails to allow high per capita incomes for their populations and permits levels of productivity in the main agricultural and industrial sectors greatly below the average achieved by the fully industrialised countries of the world.

The fact that an optimum exploitation of fishery resources calls for a highly industrialised set-up in the country in which it takes place does not mean that policies for fisheries development cannot be successful in the framework of an underdeveloped country. Such a conclusion would be in contradiction to the historical pattern of development of fisheries all over the world, and in particular to the spectacular growth within the last couple of years of the fisheries of several Latin American countries.

The success or failure of a fishery development project in an economically under-developed country will often depend on the degree to which the people are able to assimilate technological changes. Consequently, the basic principle that should be stressed when introducing new techniques always has to be the degree of technological development which can be achieved within the framework of the existing economic

structure without disturbing the economic balance of the industry. When a project aims not only at improving fishing methods but also increasing fish production, then there is also the problem of abundance of natural resources and the volume of catch which can be sustained without depleting the stocks. This calls for an extensive knowledge of the resources and eventually a programme for their management. Secondly, there is the question of full economic appraisal of alternative technological means for utilising the material resources within the limits of the industrial capacity of the country in order to meet the market requirements on a basis of economic efficiency and capital rentability. This is the only problem which will concern us in our analysis of the state of the fisheries industry in the region.

2. Labour Productivity in Fishing.

It is well known that the productivity of a high proportion of the manpower in Latin American agriculture is low. Recent studies show that the productivity per man-hour worked in agriculture may have been around one-fifth of that of the United States before the war, and presumably this ratio has become even more unfavourable in Latin America during the post-war years. Productivity in fisheries does not constitute an exception to this situation. Estimates for labour productivity per year in fishing for the nine Latin American countries, which contributed more than 97 per cent of the production of fish in the region, show an average of less than 3 tons of fish caught per fisherman. This overall figure for the whole region, compared with the productivity observed in countries with highly developed fisheries production, such as U.K., Norway, Denmark, Portugal, Iceland, or U.S.A., would, on economic grounds alone become the primary challenge to development activity.

This rather low estimate of the productivity of catch for Latin America is heavily influenced by the small-scale fishing activity which is peculiar to large coastal areas of countries which nevertheless have already achieved high aggregate catches and are the centres of relatively well developed fisheries in the region. Among those countries we find, for instance, Brazil, which contributes 27 per cent of the total landings in the region, showing a productivity rate below the average for Latin America. Mexico, Venezuela and Peru not only have a productivity rate above the regional average, but also have a highly industrialized nucleus of fisheries production where the catch per fisherman is undoubtedly much nearer the level of a fully industrialized country than is shown by their average productivity rates. On the other hand, it is felt that most of the Caribbean and Central American countries, as well as Ecuador and the Guianas, show low catch productivity rates which are representative of the low stage of economic development reached by the fisheries in those countries. This situation points quite clearly to the main problem of an overall fisheries development policy in the region. The application of well balanced national-regional plans for the raising of the productivity rates in certain areas of countries such as Brazil, Mexico, Peru and Venezuela which, already possessing large industrial nucleuses of fisheries development, are still exploiting significant portions of their potential marine resources by means of inefficient fishing and marketing techniques. A good policy of development can be based mainly on indigenous skill, the presence of which is already manifested in fisheries work. Others need help with the skill and technical knowledge and the capital incentives that have made the exploitation of the fishery resources in other areas profitable. The integration of fisheries development programmes in the overall plan of national development appears to be necessary for countries such as Ecuador, the Caribbean and the Central American countries. There are practically no industrialised fisheries in these countries. They therefore lack the main support of technical "know-how" and traditional experience that makes a balanced planning of development of their fisheries possible. Much better results could be obtained if the latter countries would rely on the technical advice and economic help of more developed countries in this field of fisheries which is available to them under the technical assistance programmes administered by FAO and other international agencies.

3. Equipment.

It is obvious that the absence of mechanized propulsion, and the consequent lack of efficiency in production are the main reasons why the output per fisherman is very low. Other factors, such as the set-up of the labour organizations and the welfare of fishermen and the lack of incentives to capital investment are more or less the related factors which, with lack of mechanization, are largely responsible for the state of inefficiency observed in the industry. Equipment such as craft, gear and shore facilities is rather unevenly distributed in the region as far as technical standards are concerned. Howard and Godfrey 2/ state that "the history of fishing in the areas under consideration shows that, for the most part, the methods used have not changed appreciably in recent decades. The craft most commonly utilized are the dug-out canoes and the dori or keeled double-duder. Both these types and other boats are made of wood and are of simple construction. They are propelled with oars and sails. Powered craft are used to a lesser extent and they are usually of small size.

The fishing gear employed includes pots, weirs, various types of gillnets and beach seines, dip nets, cartreets, hook and line combinations and other miscellaneous types. Trawling is being expanded, particularly in Argentina, Uruguay and Chile. Purse seines are used off the coasts of Mexico and Central America, and the North West coast of South America by United States concerns and are also being introduced into the domestic fisheries in these regions."

Furthermore the same authors stress that "equipment in use controls the distance at which fishermen trawl from shore. With the type of craft and gear mainly in use, fishing is limited to the inshore waters".

This appraisal of the technological standards of equipment in use in the region still applies to the present conditions in most of the under-developed areas of Northern Brazil, Ecuador, Central and Caribbean countries in the Western Zone (Lac Maracaibo, Gulf of Venezuela and the Paraguama Peninsula) and the Central Zone (lagoons of Unare, Tacarigua and Chichiaiviche) in Venezuela and large coastal areas in Peru (mainly the Southern Zone with the exception of the "Departamento di Lima", the coastal area of the States of Jalisco, Colima, Michoacan, Guerrero, Oaxaca and Chiapas (South Pacific) and most of the Southern states of the Gulf of Mexico in Mexico and the Southern Zone of Chile.

For the Caribbean the last conference on Fisheries (1952) sponsored by the Caribbean Commission recommended that the territorial governments be urged to "consider the advantages which may accrue from mechanized small boat fishing and the use of inboard or outboard engines". This could hardly be made to apply everywhere in the region but there are very many places where only a small scale mechanization is feasible at this time because of various factors which, in any large scale undertaking, would constitute minimum factors in fisheries development.

Surveying the statistical information available on the state of the fishing fleet in the technically developed fisheries centres of Brazil, Chile, Mexico and Peru, we can detect a very positive trend towards industrialization and technical improvement in methods of fishing during the post-war years. In Brazil, out of 72,702 units operating in 1950 as fishing craft, 99 per cent were small oared or sailing craft, among which the primitive type of sea going rafts and dug-out canoes predominated.

Most of the mechanized fishing fleet of Brazil is based on the Central region where purse seiners and trawlers operate from the ports of the State of Rio de Janeiro and the Federal district, as well as from Santos, the main fishing port of the State of S. Paulo. Most of the boats

2/ A summary of information on the Fisheries and Fisheries Resources of Latin America, FAO, January 1951.

from this region are not, as yet, well equipped in the way of up-to-date devices for the operation of the nets, conservation of the fish aboard, and arrangements and living quarters for the crews. The expansion of the fleet, which is underway, has been made possible by large imports from Europe, as the local shipyards are not fitted for the large-scale production of modern fishing craft.

In Chile, 60 new units between 10 and 300 GRT were introduced during the period 1943-50. The number of motor-boats of less than 10 GRT has also increased substantially since 1943. Almost all the present fishing fleet was built in Chilean yards using local materials and labour. Nets are also supplied by local manufacturers. Present types of boats appear to be adequate to satisfy the increased demand for fresh fish.

Mexico shows an accentuated trend since World War II in the acquisition of motorised units of 10 GRT and over. In 1945 these units constituted 6 percent of the total fishing fleet. Later figures show very substantial improvements due to the expansion of large-scale fishing for shrimp along the Pacific and the Gulf of Mexico coasts. The existing fishing fleet and fishing gear are nevertheless inadequate to meet the normal demands for the expansion of the industry. Shipyard facilities are presumably not sufficient to cope with any large-scale and up-to-date boat-building programme.

Peru had 2,851 boats registered as fishing craft in 1949. The motorised fleet consisted of 577 units, or 20 percent of this total. Owing to the low technical efficiency of the majority of units in the Peruvian fishing fleet, primary production still lags far behind the productive capacity observed in the secondary industries. Fortunately their shipyards have been remarkably successful in adapting their output in response to increasing pressure from the industry for higher levels of production.

In general it might be said that the post-war period has seen considerable progress with respect to renewal, mechanisation and expansion in the fishing fleet of the region, but this has not yet led to an adequate increase in the average catch per fisherman. The average catch per fisherman which still prevails in many countries of the region shows, however, that the advances are not adequate. Much has still to be accomplished in this sector in order to attain the best possible use of the marine resources.

It might be fitting in this connection to refer briefly to recent progress in the fields of gear technology in areas which are already in a stage of relatively industrialised development; improved techniques in fish detection and capture and the valuable experience acquired by marine fishery industries in other parts of the world represent a challenge to the fishery industries of Latin America. Echo-sounding and Radar equipment, for instance, are quite commonplace in modern fishing vessels. The mid-water trawl, developed in Europe, is now being used with success by fishermen in several countries. Before the introduction of this method of fishing, fish capture in the intermediate water layers was restricted to gears which could not be towed.

These few examples may be sufficient to indicate that theoretically there is a large field for new ideas and new techniques, already tested in other parts of the world, to assist the technical development of the primary industry in the region, but it would be completely unrealistic to imply that these improvements are within near reach of individual fishermen, who are still working on a basis of small-scale production. For them the local inshore fisheries provide the only activities which their limited capital means can support, and any improvements in methods of fishing have to be planned on the scale of their actual possibilities. On the other hand, it is quite obvious that "mechanization and large-scale offshore operations, involving up-to-date craft and elaborate equipment of many kinds, may be the only means by which the Latin American countries can utilize all the fish resources which are off their shores. Larger units

and more elaborate equipment also involve readier access to markets, improvements in quality by means of storage and refrigeration and shore facilities fitted to serve an up-to-date fleet. Even when the psychological and technological problems of providing this material have been overcome, there remains the problem of its economic feasibility. It must be borne in mind that the minimum requirements for implementing large-scale mechanization are costly and will weigh heavily in the costs of production if mass demand has not been previously secured.

4. Labour

The proportion of the population that is engaged in primary occupations (agriculture, forestry and fishing) is higher for Latin America than anywhere in Europe or the Americas. The proportion of the agricultural population which is engaged in fisheries (not necessarily including fishermen only) is nevertheless one of the lowest in the world - less than 0.3 per cent of the total agricultural population. Estimates for 1950 show a total number of active fishermen for the region in 15 countries of around 230,000. As we have already observed the annual per capita output of these fishermen was found to be around 3 metric tons, which contrasts with the average of 15 metric tons for the U.S.A. The productivity of Latin American labour is considered to be low compared with more industrialized regions. Nevertheless productivity in fisheries is still on an average lower than in any other branch of the primary activities. The ability to produce is clearly affected by the low health and educational standards of the area, by the system of small-scale production and by the primitive forms of economic organization.

There is no doubt that, given suitable standards of health and education, equal training, equipment and competent institutional organization, the Latin American fisherman might be expected to produce as effectively as the fisherman of the more advanced countries. In terms of development policy it might be stressed that one of the main fields for developmental activity still lies in improving the living standards of the fishermen, and their conditions of work. This can be accomplished in several ways either by direct assistance to fishermen in the form of general conditions of employment where systems of remuneration, continuity of employment, medical care, safety at work, vocational training and social security could be the object of special protective legislation; by means of standard contracts and conditions of engagement; or indirectly by promoting the growth of fishermen's organizations on a co-operative basis.

Methods of remuneration to fishermen in the more industrialized countries where private enterprise predominates, indicate the advantages of giving the fishermen incentives which are related to an increase in the volume and improve the quality of catches. In most countries a mixed system consisting of a participation in the gross proceeds of the sale of fish or participation in the gross or net profits of the catch plus a fixed salary established on a professional category basis are contributing to an increased efficiency in the work of the fishermen.

In general in Latin America the earnings of fishermen on a per annum basis, and accounting for the wide seasonal fluctuations in unemployment characteristic of the industry, are lower than in many other agricultural or manufacturing industries.

The average income of fishermen in Chile ranges from 1,000 to 2,000 pesos monthly, but individually might vary from about 500 to 3,000 pesos which is still below the average monthly earnings in many industries. The chief problem among fishermen is the lack of means to purchase adequate craft and gear. Earnings of the independent fishermen in Mexico vary greatly in accordance with equipment, hours worked and productivity of the region. An estimated average for 1949 shows a range of net earnings between 1.50 and 5.50 pesos per day which is perhaps above the average daily earnings of 2.40 pesos for the agricultural worker in the period 1948-49, if seasonal variations are discounted. The insecurity of employment, which is characteristic of the industry, brings this figure to a much lower level on an annual basis. Countries such as Brazil, Ecuador, Peru, Venezuela, the Caribbean area and Central America show, more or less, identical conditions in the levels of fishermen's earnings.

Social and credit schemes which can lead to substantial improvements in welfare conditions and, consequently, in the productivity of fishermen in the region, are operating in Brazil, British Guiana, Barbados and Venezuela. The policy of the Fisheries Division in Barbados regarding credit and insurance facilities for local fishermen is worthy of special reference. At the end of 1951 the loan scheme had issued over 1,140 loans to fishermen and boat-owners, involving a total of $113,701.31, and was responsible for an increase of about 100 per cent in the number of fishing craft. Boats can be insured for their market value or 80 per cent of the replacement

value, whichever is less. In Venezuela, either through special credit entities or through the "Corporacion Venezuelana de Fomento", the Government has been following a general policy of giving loans to fishermen in the form of money credits or in kind, mostly out-board and in-board motors.

The organization of fishermen in Cooperatives has proved to be one of the most effective institutional set-ups for the efficient exploitation of fishery resources and the marketing of fish when it received the necessary Government assistance and is not hindered by lack of managerial initiative. Fishermen's cooperatives for production and marketing play a very important role in countries such as Brazil, Mexico, British Guiana and some Caribbean territories.

The Brazilian law requires that fishermen belong to societies which must have a minimum of 150 members. These societies levy a 3 per cent tax on the catch out of which certain services are provided, including education, medical care and loans for financing the purchase of boats and gear.

In Mexico, fishermen's cooperatives receive support from protective legislation mainly in the form of exclusive fishing rights in certain zones and for determined species. In 1950, the number of fishermen grouped in cooperatives was around 40 per cent of a total of 20,000 fishermen. In British Guiana the promotion of fishermen's cooperatives has been receiving high priority under the local Fishery Administration schemes for increasing production. Recently a consumer cooperative store has been organised for the bulk importation of all fishery requisites which were formerly purchased on an individual basis and which collectively represent very substantial orders.

The Caribbean Commission in its Fisheries Conference held in Trinidad in March 1952, noted a special recommendation calling for "urgent consideration by territorial Governments of the application and extension of cooperative principles to fisheries with regard to marketing, credit and savings, purchase of gear and insurance, for the purpose of developing the fishing industry of the area".

It is felt that the fisheries industry in the whole Latin American region could greatly benefit in terms of productivity and economic rentability if the cooperative sector could be expanded on a basis of Government assistance and overall coordination with the private sectors of the economy.

5. Secondary Industry

The industrialization of fish processing in Latin America is still in a state of technical and economic under-development as far as freezing, curing, canning and by-products factories are concerned. Except in a few industrial centres located in Chile, Mexico, Peru and Venezuela, advanced methods of fish processing have comparatively minor importance in the economy of the industry. In 1951 the fresh fish market[3/] absorbed 41 per cent of total landings as compared with 30 per cent in the United States. Frozen fishery products which have become so important in North America only correspond to less than 4 per cent of the landings. Salting, drying and smoking with very primitive techniques are still the dominant processes of preservation. Throughout the area (with the exception of Peru and Mexico), about 18 per cent of all commercial landings in seven of the main producer countries in the region are subjected to these processes. Although canning represents as much as 25 per cent of the total landings in the countries surveyed owing to the weight of the Peruvian and Mexican output, it is less important than curing as far as the whole region is concerned. In net weight it was less than 4 per cent of the world canned output in 1950 (main producer countries). Fish meal and oils contributed a significant production in Argentina, Chile and Peru, where they amounted to 28,000 metric tons in 1951, or 3 per cent of the recorded world production for the year (main producer countries).

3/ Based on information from 7 countries which have 94 percent of the total landings in Latin America.

The structure of primary production and trade in the region is in many ways determined by the low degree of industrial development in the preservation of fishery products and the production of by-products. In fact, the impact of fluctuations and irregularities in fish supplies is much more powerful in Latin America than in other more industrialized regions because of this lack of preservation facilities and of a by-products industry capable of "smoothing out" surpluses. This particularly affects the price structure in the region owing to the instability of earnings and profits and unnecessarily high production costs resulting from low unit production and wastage.

Industrialization, through mechanization of fish processing with up-to-date technological methods, is a very necessary step for the balanced development of the fishing industry in the region. As was stressed in the case of primary production, there are limits to mechanization owing to mass purchasing power problems and/or consumer resistance to certain types of fisheries products which need to be taken into account for each particular case. There are countries like Chile, Mexico, Peru, Venezuela, Argentina and Uruguay where a sound policy of mechanization of the secondary industry could succeed on the basis of the present economic structure of those countries. There are countries such as Ecuador, and other relatively less developed areas where a mechanization policy would meet very diverse difficulties, if not failure.

On the other hand, the mechanization of the secondary industry has particular features, because of the periods of idleness resulting from seasonal variations in supply, which in themselves constitute in many cases a natural limitation to large capital investments in this section of the industry.

5.1. The Freezing Industry

The production of frozen fish products (whole fish and fillets) is particularly important in Chile, Mexico and Peru. In the two last-mentioned countries the freezing industry has developed mainly because of a steady demand for shrimp, tuna and tuna-like species in the United States markets. Although Chile has several freezing plants in operation, its frozen products are not widely acceptable. Lack of modern machinery and the use of sub-standard methods of operation make the final output inferior in quality, and the prices beyond the means of the large public.

In Mexico the largest output is frozen shrimp, which is almost entirely exported to the United States. In 1950 around 18,000 metric tons of shrimp were consigned for freezing out of total landings of over 24,000 metric tons More than 10 varieties of fish are also processed in the Mexican freezing plants. The equipment in use is modern and efficient and the final output of good quality and price. The plants do not normally work at full capacity owing to lack of raw material, mainly shrimp, although the resources could be subject to more intensive exploitation.

In Peru there are at present 20 vessels with refrigeration facilities, with a capacity to freeze 330 metric tons of fish in 24 hours and to store up to 4,400 metric tons. The shore freezing plants in operation have a total capacity to freeze 130 metric tons and to store 2,200 metric tons of fish per day. The importance of the freezing industry in the country can be evaluated when it is noted that 10 percent of the 1950 catch was consigned to freezing plants, mainly for eventual export to the United States markets. The domestic consumption of frozen products is around 200 metric tons per year. The most important species used in the freezing plants are the Bonito, Yellowfin and Swordfish. The effective production of frozen fish is very much below the actual capacity to produce shown by the above-mentioned figures. This situation illustrates how far the freezing industry still is from its main role of stabilising the volume of supplies in the domestic fresh fish market with the result of increased demand for fish on the basis of a price structure much less sensitive to seasonal fluctuation.

5.2. The Curing Industry

Curing by salting, drying, salting-and-drying and smoking of fish and shellfish is second in importance to only marketing as fresh so far as the Latin-American markets are concerned. Curing is still the predominant form of fish processing in Brazil, Ecuador, Venezuela, the Caribbean area and Central America. In general, the technological methods used for these forms of curing are primitive, giving products of low quality subject to excessive shrinkage which only keep for relatively short periods. Small scale production in primitive curing yards, located near the shore along the margins of the principal rivers and lakes in the region, is characteristic of the bulk of the production of the production of Brazil, Ecuador, Venezuela, Colombia, the Caribbean territories and some of the Central American countries. More up-to-date facilities for curing are found mainly in Argentina, Chile and Peru.

5.3. The Canning Industry

Canning is one of the most industrialized sections of the fishing industry in Latin America. During post-war years this industry has developed considerably for the whole region and in particular in Argentina, Brazil, Chile, Mexico, Peru and Venezuela, in an attempt to supply home markets by competing with foreign producers. Moreover, Mexico, Peru and Venezuela have succeeded in entering the international trade in canned products in foreign markets which before the war were monopolized by traditional world suppliers like Norway, Portugal, Spain and Japan.

In 1950, the total production of canned fish and shellfish products for five of the main producer countries of Latin America was 43,127 metric tons (net weight), the bulk of which belonged to the tuna and herring families.

Production of canned fish and shellfish products in selected Latin American countries, 1947-51

(Metric tons4/)

	1947	1948	1949	1950	1951
Total:	...	...	...	43 127	...
Chile	...	...	5 594	4 411	4 598
Peru	...	...	...	9 377	...
Mexico	15 547	16 368	12 802	15 839	...
Venezuela	7 479	9 280	6 552	*7 500	...
Argentina	...	...	*6 500	*6 000	*7 000

4/ Net weight.

In Chile, where the production of canned fish and shellfish has increased steadily over pre-war figures, the industry, with few exceptions, does not use modern machinery or efficient production methods. Costs of production are, therefore, relatively high. The national pack is chiefly composed of sardines, tuna and herring. In Mexico an important part of the catches, estimated at around 30 percent, is utilized for canning, of which the bulk comprises California sardine, Pacific mackerel, abalone, tuna, Spanish mackerel and shrimp. The most important canneries are located in the peninsula of California and in Sonora and Veracruz.

At present in Peru there are in operation more than 50 canneries with a total production capacity of around 180 metric tons per day. The effective production was in 1951 nearly 17 percent of the total annual capacity. This indicates a rather large latent capacity for increasing the production of canned fish on the basis of the present industrial set-up. Canned bonito and canned tuna represent more than 80 percent of the national output. After these, in order of importance, are "Barrilete," "Machete," "Sardina" and "Cabala".

The most pressing problems which the Latin American canning industry has to face in order to reduce costs of production and enter into a phase of mass production are the replacement of obsolete machinery, the improvement in quality standards either of the product itself or of the cans, with special attention to the production of internationally recognized standard sizes, and, finally, a cheaper and more reliable supply of tin-plate for the manufacture of the cans. It is obvious that until these problems have been solved in an overall policy for the countries concerned, the possibilities for expanding the potential home and foreign markets for canned fishery products will be very slight in the region.

5.4. The By-products Industry

Fish meals and fish oils are by-products made from the residual offals which occur during handling and processing and from whole fish either taken exclusively for this production or surplus to requirements for human consumption. Fish liver oils of medicinal or industrial value, mainly extracted from shark-livers, form a rather independent industry having primary importance in the catch of these species in Argentina, Ecuador, Mexico and Peru. Argentina, Chile and Peru are the countries where fish meal and oil production is based on a comparatively industrialized set-up. In other areas this industry is still at a primitive level of economic and technological development and is in many ways analagous to the small-scale production by individual fishermen which characterizes the curing industry in the less developed areas of the region.

In Argentina the production of fish meal and oil from fresh-water species, mainly, "Sabalo", absorbs the bulk of the national output of these species. In 1951 it amounted to 7,747 metric tons or 11 percent of the total marine and fresh-water landings. The shark-liver oil industry has developed very extensively since 1945 on the basis of new plants for processing shark and by-products located in the Mar da Plata area. The actual production of shark oil is over 7,000 metric tons annually.

Annual production of fish meal in Chile was estimated in 1951 to be about 5,000 metric tons, while fish oil production was still very limited at a little over 100 metric tons for the same year. The majority of the raw material used is hake caught by trawling in fishing grounds off the central coastal area of Chile. There seem to be good prospects for the expansion of fish meal production both from waste and from direct fishing

In 1951 fish meal production in Peru amounted to 7,260 metric tons, half of which derived from offal supplied by the canneries processing "Bonito" and the remainder from raw material supplied as whole fish of the "Anchovita" and "Machete" species The by-products industry in Peru has wide prospects for future development observing that the canneries and freezing plants are already sufficiently industrialized to absorb a large share of the raw material required by the meal and oil plants. Moreover, the present level of canned fish production is well below the full capacity of the canneries.

. . .

6. Production

Production of food in Latin America has not kept up with the growth in population in post-war years. Fisheries production, however, has shown in the period 1949-51 an average annual rate of increase of 9 per cent, which is well above the average annual rate of increase in the population of the region during the same period.

Recent estimates for landings in 20 Latin American countries give an overall figure of 620,000 metric tons of fish entering trade. This figure should be considerably increased if subsistence fishing, which represents a large activity in countries such as Brazil, Venezuela, Colombia, Ecuador, the Caribbean area, and most of the Central America, is taken into consideration.

The uneven level of techno-economic development and the unequal rates at which production is increasing are due mainly to economic and social limitations and are striking features in Latin American fisheries. The marine resources, although varying greatly in their natural abundance and composition, cannot alone explain the reason for such discrepancies in levels of economic exploitation. Countries such as Chile, Brazil, Peru, Venezuela and Mexico, with coast lines in all the main fishing zones of the continent, are contributing annually more than 80 per cent of the total landings in the region, while the remaining area (15 countries) covering analogous marine resources contribute the remaining 20 per cent. Recent studies show wide prospects for the large-scale exploitation of marine fishery resources in countries such as Argentina, Ecuador, Uruguay, Colombia and Cuba, which nevertheless have a very rudimentary fishing industry and as a group are contributing to around 19 per cent of the estimated total for the region. Inshore waters are capable of producing larger yields in Brazil, Colombia, Argentina, Paraguay, Bolivia and Mexico. More intensive fishing and the exploitation of new fishing grounds could expand considerably the already developed fisheries of Chile, Brazil, Peru, Venezuela and Mexico.

The 6 most important fish producing countries in the region in terms of recorded landings in thousands of metric tons (1951 estimates) are Brazil (160), Peru (106), Chile (93), Argentina (77), Venezuela (75) and Mexico (70). These figures give only a rough idea of the order of importance of the catch in the region by the total weight recorded as landed. Considering the commercial value of the species, which contribute to this total figure for each country, Peru, Venezuela and Chile would presumably rank much higher than the other countries.

Table 2 indicates very roughly the composition of the catch as it was estimated for 5 countries in the region (Argentina, Brazil, Chile, Mexico and Peru) which in 1951 contributed 80 per cent of the landings. These figures are not strictly comparable since they refer to different periods of observation. Moreover, Brazil is represented by the landings in the more industrialized states of the southern region since data showing the composition of landings by species were not available for the whole country.

The most important species for these countries (with coasts along the Atlantic and Pacific covering many of the fishing grounds already under intensive exploitation) belong to the groups of tunas, true mackerels and similar species, and the crustaceans and mollusks. In Argentina, apart from the fresh water species, the perches and the hake group accounted in 1945 for 50 per cent of the total marine landings. In Brazil, the herring species and the perches group constitute the bulk of the catch. In Chile, hake, herring and tuna groups accounted for 67 per cent of the 1950 catches, while crustaceans and mollusks contributed as much as 18 per cent. In Mexico, crustaceans and mollusks came first with 39 per cent of the landings in 1946. The herring group took second place in total landings (fish, crustaceans and mollusks) and first place in domestic landings during the same year. The tuna group would nevertheless take first place in the total catches if the amounts caught in the Mexican territorial waters by foreign vessels were taken into account as national production. In Peru, the bulk of the catch corresponds to the tuna group, with 65 per cent in 1950. From a purely commercial point of view the catch composition observed in the 5 above mentioned countries seems to be very advantageous for the region as it shows a predominance of high priced species above the average in the world catch pattern.

Considered as underdeveloped areas in marine fisheries production and marketing (apart from the River Plate area, which presents peculiar economic features not found elsewhere in Latin America) the Central America, the Caribbean area, the North Pacific coastal area of Colombia and Ecuador, and the Northern and North East area of the Guianas and Brazil, the general pattern of the primary fisheries production is characterized by levels of physical productivity and capital investment per fisherman much below the average level for the region as a whole and showing very significant discrepancies between productivity and capital levels found in more developed areas such as Southern Brazil, Chile, Peru or Mexico. Among the many factors which are hampering the growth of fisheries productions in these underdeveloped areas, the limitations imposed by the peculiar economic and social structure predominate. Lack of reasonable marketing organization and an efficient transport system to handle perishable foodstuffs, high costs of distribution, and deficiency in purchasing power in the lower income brackets of the population undoubtedly supply the main reasons for the low levels of productivity observed.

This situation reveals the need for improvements in methods of fishing in these areas consistent with the existing shore and distribution facilities, and the market capacity. Although the modernization and mechanization of craft and gear offers the most effective means of increasing catches, it is evident that progress has to be made gradually alongside a rational expansion of the home market based on cheap protein supplies, mostly in a fresh and salted and/or dried form. Any spectacular measure, especially if it demands heavy investments, and is hastily applied, will have little chance of success.

In the relatively industrialized nucleus of fisheries production located in countries such as Chile, Southern Brazil, Peru, Venezuela and Mexico, the most urgent needs for development demand the reduction of costs of production through the modernization of craft and gear. Brazil is steadily increasing its fishing fleet; the Chilean Government is sponsoring a large investment plan to modernize the fleet and extend shore facilities. In Mexico a special Commission of the Mexican Navy Department is preparing the construction of two small fishing fleets to serve the Gulf of Mexico and the Pacific coast fisheries. Peru and Venezuela are also carrying out long-term programmes of modernization and expansion of their fleet.

The secondary industry is also expanding considerably in some of these countries. Cold storage facilities and freezing plants are being built in Brazil, Mexico and Peru. Uruguay and Argentina are working on projects to implement cold storage facilities as well as on consumer education measures intended to expand the domestic market for fish. Chile, Peru and Venezuela are investing considerable capital in new canneries. All these projects under-way in the field of the primary and secondary industry necessarily call for expanded market outlets. The Governments and the industry in these countries are already taking decisive steps along these lines.

Many markets have to be found in the inland areas, mostly for the less expensive fresh fish species and dried and/or salted products. The markets in the larger urban centres could also be considerably expanded for both cheap and high priced fresh or frozen and canned products if up-to-date methods of handling distribution and transport were introduced.

A general appraisal of the fisheries in the region shows that in the period 1949-51, substantial progress was observed, but there is still room for the profitable expansion of the industry on the basis of the vast but still unexplored marine resources and the potential capacity of the home markets to absorb an increased fisheries production.

7. Market: Demand and Prices

Annual per capita fish consumption for the region computed on the basis of average figures for 1949-51, ranges from 0.7 kg. in British Honduras to 15.8 kg. in Venezuela. Per capita consumption figures computed on a national basis do not reveal the significant fact that the coastal areas and the large urban centres near the coast are the main centres of fish consumption in the region. The most important producers of fish, such as Brazil, Chile, Peru, Mexico and Venezuela, have annual per capita consumption levels of 4.6, 14.5, 8.1, 1.3 and 15.8 kg., which are lower than those of the larger fish-producing countries in Europe. These levels of fish consumption in Latin America are indirectly the result of the economic structure of the region, where a rather low per capita income prevails compared with the U.S.A. or some European industrialized countries. They are nevertheless directly affected by specific fisheries factors such as consumers' preferences for other foodstuffs, high prices quoted for fishery products at the retail and wholesale level and the wider availability of other local competitive commodities such as meat, cereals, poultry and beans. There is no definite general pattern in fish consumption for all the region. Nevertheless we may say that in the period 1949-51 among the larger fish producers in the region (Argentina, Brazil, Chile, Ecuador, Mexico, Peru and Venezuela, which contribute around 94 percent of the total production in the area) 49 percent of the landings were absorbed by the fresh and frozen market, while 17 percent and 2.2 percent respectively were processed as cured or canned products. Recent trends reveal a slightly increased demand for fresh and frozen products in Argentina and Peru, for cured products in Brazil and Ecuador and for canned products in all of the countries surveyed. Consumer preference is very strong for cured products in Brazil, Ecuador and Venezuela, while in Chile, Mexico, Peru and Venezuela consumption shows the highest per capita consumption of canned products in Latin America. Moreover, in countries like Chile, Peru and Mexico, fish has recently become increasingly important as a competitor of meat. The meat shortage in the Argentine market since 1949 has also had a slight impact on the consumer demand for fish. Import restrictions in Brazil have had a marked effect on this traditional market for the imported salted-dried cod. Venezuela continues to be one of the most important markets for processed fishery products, although the imported canned products have recently met with difficulties when entering the market in competition with the domestic output.

Table 6 shows estimates for annual per capita consumption in 7 countries of Latin America, amounting to around 94 percent of the total landings in the region, broken down by main groups of edible fishery products. The low per capita consumption of fish which characterizes the region in comparison with more developed areas is nevertheless accentuated as far as processed products are concerned. This is a very significant indication of the fact that the many possibilities observed in industrialized countries for diversifying and improving preserved fish products in order to attract consumer preference and raise the general level of consumption, have so far remained unfulfilled in the region. This situation, as has been stressed already in the case of the secondary industry, also has economic implications more far-reaching than the limitation of consumer markets. In fact, it directly affects the state of the whole industry because of the instability in primary production and markets which results from the inability to stockpile and thereby offset seasonal variations in supply and demand. Fresh fish consumption in the region, although showing higher per capita figures than those observed for the processed products, is nevertheless well below the potential market capacity. Improvements, such as more hygienic handling and storage of fish on board, the wider use of ice at sea and during transportation and retailing, and the more attractive presentation of fish products, constitute the main problem to be faced without exception throughout the region. This will eliminate the factors that are at present restricting demand.

In this sector, as also in the primary and secondary industries, technological improvements and "mechanization" are not in themselves the only alternatives for an overall policy of "cheap" fishery products. Reduction in costs of production and distribution, although the main target in the drive to promote the mass consumption of fishery products with due regard for the low levels of per capita income prevailing in the region, would also result from better marketing organization and the elimination of unproductive links between fishermen and consumers.

A general survey of fish prices for the region indicates a generally high margin between the prices paid to the fishermen and the selling prices to the consumers. Irregularity of supplies, wide daily and seasonal variations in price, inadequate preservation and poor quality are still the main factors which restrict demand. In general, retail fish prices have increased since 1949 but less than meat prices. Argentina, which by reason of her exceptional position as a large meat producer, exporter and consumer, can be taken as an example for South America. The retail price of "Corvina" increased by 35 percent from 1949 to 1951, while the price of beef was raised by 174 percent in the same period. In Chile, recent studies show that from a nutritional point of view the price of an equal amount of protein from fish or from meat is, on average, less for the former. In this country too, which has one of the largest per capita consumptions of fish in all Latin America, fish prices on average have increased less than meat prices since 1949.

In Mexico, the prices of certain popular qualities of fish are on a competitive level with the average prices of meat, chickens and pulses. Since 1948, the high-priced species of fish have increased more than the others, but fish is still on a competitive level with many other foodstuffs.

The steady increase in the price of raw materials for fishing requisites (craft, gear and secondary industry) originated during World War II and, continuing in post-war years, have substantially increased the cost of fisheries equipment all over the world. Although the Latin American region is a world supplier of several of these raw materials, this upward trend in world prices has been equally evident in the Latin American markets and points to the absence of controls establishing preferential prices for the fishing industry. This situation has particularly grave effects on an industry which, still in its early stages of development, urgently needs to provide incentives for the heavy capital investments on which the development of its primary and secondary undertakings depend. Consumption levels in the region have also been directly influenced by the costs of production and indirectly by restrictions placed upon the normal expansion of fishing activities by this increase in the prices of fishery requisites.

A very active policy of consumer education for fishery products has been carried out with notable success in Chile, Ecuador, Puerto Rico, British Guiana and Peru. In Uruguay and Argentina the problem of increasing mass fish consumption in order to balance the diet and as part of a general policy of increasing meat surplus for export is also being examined with reference to the need for consumer education.

In general, it may be said that fish consumption in Latin America can be substantially increased if irregularities of supply can be eliminated and if adequate supplies of good quality fish can be made available daily at consumer centres.

Prospects for the expansion of markets for salted and/or dried fish in inland territories and among the low income groups of the urban centers are exceptionally favorable in Brazil, Chile, Ecuador, Mexico and Venezuela. There are also possibilities for expanding the fresh, frozen and canned products market in Argentina and Uruguay. Peru, Mexico and Venezuela are interested especially in extending their domestic markets for canned products in order to offset any eventual restriction of their export trade in these commodities. Mexico, for the same reason, is also planning to increase fresh and frozen facilities in the large urban centers.

8. Foreign Trade

An analysis of the external trade in edible fish products shows that 18 countries, which together account for 99 percent of the total catch of the region, imported the equivalent of 29 percent and exported the equivalent of 9 percent by weight of their total domestic landings. Of these, one group comprising Chile, Mexico and Peru, had a favorable balance of trade with a collective net export averaging 41,000 metric tons annually - equivalent to 20 percent of their domestic landings. Another group, comprising Bolivia, Dominican Republic, El Salvador, Haiti and Nicaragua, had negligible exports, while their total imports only averaged 20,444 metric tons annually. A third group, comprising Argentina, Brazil, Colombia, Costa Rica, Cuba, Ecuador, Honduras, Panama and Venezuela had a less favorable balance with a collective net import averaging 135,396 metric tons annually. The most impressive feature of the Latin American external trade in fish products is the increasing importance which this region has assumed in world trade. This can be appreciated when it is realized that the total value of exports for the region (21 countries), which in 1938 was around 5 million U.S. dollars, rose to around 55 million U.S. dollars in the peak year 1950, which represents an increase of 1,000 percent in the nominal value of fishery products exported between 1938 and 1950. The total value of the export of fishery products from Latin America in 1950 accounted for only 0.8 percent of the total exports from the region. This figure, if compared with the importance of the external trade in fishery products in the main producer countries of Europe, may appear rather insignificant. It represents nevertheless a contribution to the trade balance of the region which already exceeds that of many other primary and secondary industries. Out of the total value of exports in 1950, Mexico contributed 84 percent; Peru, Cuba and Chile contributed 11 percent, 3 percent and 1 percent respectively. The post-war increase in the value of imports was not so spectacular. Overall imports amounting to 9 million U.S. dollars in 1938 increased by 250 percent to 31 million U.S. dollars in 1950. Of this 1950 total, Brazil contributed 52 percent, Cuba 24 percent and the remaining countries less than 3 percent each.

Analyzing the structure of trade by commodity groups during the period 1949-51, it will be seen that by weight fresh or frozen fish took first place amongst exports, reaching a peak of 122,320 metric tons in 1950. This was followed in the same year by crustaceans and mollusks (fresh, frozen, cured or canned) amounting to 20,242 metric tons, and canned fish amounting to 10,000 metric tons. In the fresh and frozen group and the crustaceans, Mexico supplied the bulk of the exports, with 112,190 metric tons and 19,236 metric tons respectively in 1950. Exports of canned fish from Peru were 8,721 metric tons in 1950, or 87 percent of the total for the region. There has been a tendency for a slight increase in the export of fresh and frozen fish and a rather accentuated upward trend in the exports of canned fish since 1949. Crustacean and mollusk exports have been stabilized at the 1949 level.

In the structure of the import trade, cured fish took first place with 48,085 metric tons in 1950, the greater part of which was absorbed by Brazil (54 percent) and Cuba (25 percent). Canned fish followed with 13,706 metric tons in 1950, shared by Cuba, Colombia, Venezuela and Ecuador, which took 41 percent, 17 percent, 14 percent and 10 percent respectively.

For all of these products a rather accentuated upward trend in imports has been observed since 1949. The inter-regional trade among the Latin American countries still represents, with the exception of cured fish, a rather small share of the total exports from the region, either in value or weight. In the case of canned products, the inter-regional trade was less

than 0.6 percent in physical volume of the total exports in 1950. It may be noted that it has decreased substantially since 1949 compared with 1947 and 1948, when it amounted to 12 percent of the total exports from the region. The main market outside the Latin American region is the U.S., which during the post-war years has been absorbing an increased volume of canned products, and which in 1950 reached a peak of 8,043 metric tons. In 1951 this figure dropped very substantially due to trade restrictions. Europe took the second place, showing a marked upward trend since the war, with 890 metric tons in 1950.

Fresh and frozen exports from the region are mainly absorbed by the U.S.A. In 1950, this market took 121,590 metric tons out of a total of 122,326 metric tons. Tuna and tuna-like species from Mexico, Peru and Costa Rica represent the bulk of this trade. Exports of cured products from the region are channelled mainly to the South and Central American markets. Brazil imported from other Latin American countries 107 metric tons of cured products in 1950, or around 40 percent of the total exports from the region in this year.

The prospects for an overall expansion of the external markets are not very bright for many of the Latin American countries. World food shortages following World War II and the policies adopted to relieve the needs of war-ravaged countries created a steady foreign demand for the Latin American fisheries products, especially fresh or frozen and canned varieties. In Mexico, Peru and Chile, for example, this situation attracted a flow of capital into the primary and secondary industries, which raised investments from their rather insignificant pre-war levels, to nearly 40 million U.S. dollars. Freezing plants and canneries were built with a potential capacity of well beyond that of domestic markets.

The trade restrictions which, since 1949, have severely restricted the free flow of commodities into the traditional markets for fisheries products have seriously affected the export trade of the more industrialized producer countries in the region. Moreover, their products were always competitive in quality and price with the products coming from such traditional world suppliers as Norway, Portugal, Spain or the U.S.A. This situation explains why countries such as Mexico, Venezuela and Peru, which have been strictly dependent on their export market for the development of their domestic industries, had already in 1951 reached a very critical situation in regard to the disposal of their surpluses. The attempts which are being made at present in these countries to expand the domestic market seem to be the only rational approach to the problem of rescuing the industry from its present critical situation.

9. Investments

Latin America cannot hope to have the advantage of more up-to-date techniques which fisheries research has developed during the last decades without a very substantial outlay of capital. Investment is needed not only for equipment in the primary production (craft, gear, shore facilities), in the secondary industry (freezing plants, canneries, meal and oil plants, etc.) and trade (refrigeration facilities, store-houses, market-outlets, etc.), but also for general or complementary services such as transport, technical training and research.

Considering that, in some countries, the industry is still at an early stage of development and, in most countries, has not even begun to become industrialized, it is obvious that accumulation of capital within the industry itself cannot cope with the present investment needs. Only a large flow of capital from other sources could lead the industry to a more advanced stage of development. Such capital might come from the official Government's sector or from the private sector of the economy.

If we take Mexico as a "standard" for other Latin American countries with regard to average conditions of abundance of resources and fishermen's skill, we note in table 23 that the rate of capital invested in the primary industry for 1,000 kg. of fish and shellfish caught was an estimated average of US $70 in 1950/51. If our target is to double the actual average level per capita consumption of fish in the region, that is, to bring it from the actual 4.7 kg. per capita to 9.4 kg. per capita (assuming a stabilized level in the volume of imports and exports for the 1949/51 population figure) we should have to contemplate an increase of around 700,000 metric tons over the actual level of landings in the region. Assuming a constant ratio between capacity and actual production, this would mean, on the basis of the Mexico "standard", a capital need of US $49 million or more than 136 per cent of the total capital representing the 1950/51 value of investments in the primary fisheries production of Argentina, Brazil, Chile, Mexico, Peru and Venezuela. At the rate represented by the post-war average annual increase of 8 per cent in landings in Latin America it would take over 15 years to reach such a level of capital investment allowing for time-lags between investments and tangible returns. This hypothetical illustration at least shows that any process of fisheries development in the region, if it is to correspond with substantial increases in levels of consumption, will require extensive capital resources which, under present conditions, can only be subscribed out of public funds, the savings of other branches of the economy or foreign investments.

Turning now from the hypothetical line of thought, it is necessary to recall that a suitable financing of the industry does not necessarily mean large-scale investments in large undertakings. For immediate results it appears advisable in general to carry over a number of small but economically feasible projects which in the aggregate could considerably increase production consistant with present market conditions and mass purchasing power. An overall rise in labor productivity by means of improvements in management rather than by any spectacular "mechanization" of equipment should be the starting point of any investment plan in the industry. It has already been stressed that low productivity per fisherman constitute a dominant characteristic of the state of the industry in the region. For the more important producers in the region (Argentina, Brazil,

Chile, Mexico, Peru and Venezuela), table 23 gives rates of catch per fisherman, amounts of capital invested per fisherman, and capital invested per metric ton of fish caught. It must be noted in this table that quantity per fisherman is not always positively correlated with the amounts of capital invested per fisherman and that capital invested per metric ton of fish caught is frequently higher (although not in any definite relation) where production per fisherman is lower.. Even allowing for the margins of error normally found in such estimates and wide disparities in the efficiency of the respective economic investigations, this seems to point out quite clearly that costly equipment does not necessarily mean efficiency of production. Apart from such restriction, if we compare this table with the following table worked out by Dr. R.A. Kahn 5/ for analogous data for several states or provinces of U.S.A. and Canada and for Puerto Rico and Ceylon in 1948, we notice the discrepancies between the Latin American countries and the more developed areas of fisheries production appearing in this table:

State of	Capital Investment	Capital Investment per Fisherman	Capital Investment per Metric Ton Fish Caught	Ratio of Capital Investment to Yearly Sales
Washington	$63 638 924	$3 326	$ 713	2.4:1
British Colombia	30 913 279	2 528	1 107	95:1
Ontario	5 716 075	1 530	431	1:1
Nova Scotia	15 097 992	1 012	882	1:1
Manitoba	2 442 628	365	1 703	7:1
Northwest Territories	292 000	730	823	75:1
Texas	7 883 000	2 320	312	1.2:1
Ceylon	8 775 000	195	240	1.1:1
Puerto Rico	458 640	172	308	37:1

5/ Dr. Richard A. Kahn: Evaluation of Capital and Establishment of a Fishery. Canadian Fisherman, August 1951, Vol. 38, No. 8, p. 16-17.

For instance, fishermen in the State of Washington, U.S.A., are backed in their activities by a capital 6 times larger than the capital invested in Chile. Although generalizations are hardly possible as regards the subject of efficiency in production and amounts of investments on the basis of these figures the conclusion can be reached that "efficiency" does not mean automatically economy in terms of labor or, in other words, that much capital has to be invested to obtain a small increase in labor efficiency. While this may be true in highly industrialized countries such as U.S.A. where capital is abundant and labor scarce and dear, this

principle might apply in a reverse direction in less developed countries where the limiting factor is capital. The actual state of fisheries development in Latin America seems to imply that the best line of future development is in achieving the largest possible output per dollar invested in the industry on the basis of a level of capital invested per fisherman compatible with costs of production and distribution within the limits of competition with other foodstuffs. In Latin America, a higher priority should be given to efficiency in social and economic organization rather than to high levels of capital investments. Quoting again R.A. Kahn in the concluding remarks to his paper: "it can be said that in areas having a normal fish population 6/, an investment of 1:1 will assure the proper basis for a catch which is intended to be immediately used as food for people located nearby. It means for one dollar of catch value per year one dollar of investment is necessary. However, it should be considered that besides capital funds for investment there must be available a retailing fund to make immediate cash payments to employed fishermen as soon as they land the fish as well as funds to pay for gazoline, oil, gear and supply material which is used in replacement or repair. Such payments must be made by the fish producer before he receives his price and compensation for fish landed. Concluding, I may say that in underdeveloped areas at least, funds of 1½ the value of the annual expected catch should be on hand".

6/ The Author is referring mainly to the areas mentioned in Fisheries Report of the Technical Committee of Fisheries, submitted to the United Nations Interim Commission of Food and Agriculture, April 13, 1945, published in Washington, August 20, 1945.

10. Industrial Organization and Government Intervention.

The Institutional setting of the fishery industries in Latin America does not differ in its relevant features from the general pattern prevailing in the region. Small individual producers predominate in the less industrialized areas and supply the bulk of total landings in Northern Brazil, Colombia, Ecuador, Venezuela, the Caribbean region and Central America. Medium and large corporations are mainly found in Southern Brazil, Argentina, Uruguay, Chile, Peru and Mexico. Fishermen's cooperatives in primary production and in trade prosper in countries where the official policy has favored its growth, as in Brazil, Chile, and not least in Mexico and the Caribbean area. There are also official or semi-official organizations which, through special Government bodies such as "Corporaciones de Fomento" integrate the fishery industry in all its branches within the overall program for the national economy. This form of official intervention is particularly characteristic of Chile, Colombia and Venezuela.

A large place as producer, although not on an economic enterprise basis, has also to be given to subsistence fishing, which prevails practically everywhere in the region, and is accentuated in Brazil, Ecuador, Venezuela, Peru and throughout the Central American and Caribbean area.

In view of the preponderance of small individual producers in the industry throughout the region, any development policy intended to raise levels of catch productivity and welfare conditions as a whole should be concentrated in finding more efficient forms of organization in this large section of the industry.

The promotion of the cooperative section through special assistance from the Governments and the application of preferential legislative measures and/or the operation and facilitation of credit schemes intended to create conditions for the growth of the small individual producer could be carried out as a separate or a simultaneous policy, and would be a very realistic approach for the initiation of any development programs in the region. This policy has been followed with great success in Mexico since 1948 with practical legislative measures in favor of the fishermen's cooperatives, and more recently in Barbados, British Guiana, Puerto Rico and Brazil, where the local Fisheries Administration or the Government have been giving assistance to fishermen in the form of loans and insurance facilities, mainly through their cooperatives and class associations.

The official and semi-official sections have also been very active elements in the initiation and carrying out of development programs or in creating the incentives for the progress of the private industry.

Puerto Rico through its Industrial Development Company, and Chile and Venezuela, with development corporations, are examples of this last form of Government assistance to the industry by Government-sponsored bodies working on a basis of full cooperation with the private section, subsidizing fishing companies, giving loans to fishermen and ship-builders and financing the construction of cold storage plants and other fisheries installations.

Special banking institutions are also playing an important role, in collaboration with the Development Corporations or the Fisheries Administration, in the development of the private section of the industry. In Argentina the Banco de Credito Industrial gives credits up to 50 per cent to fishery companies and also individual fishermen. In Venezuela the "Banco Agricola y Pecuario" grants small loans to individual fishermen.

Examples of State Corporations, themselves undertaking the full responsibility for the development programs sometimes in competition with the private section, are found to be operating with more or less success in Colombia and Uruguay.

In Uruguay, the SOYP (Servicio Oceanografico y de Pesca), as an agency of the Ministry of Industry, monopolizes practically all the fishing activities of the country, contributing more than 76 per cent of the total landings.

In Colombia the most important fishing company is the Government-sponsored Colombian Marine Fishing Industry (Industriva Colombiana de Pesca Maritima S.A. ICOPESCA), which is playing a dominant role in the development of the fisheries of the country.

All these forms of institutional approach to the development programs in the region on a Government or semi-private or private level have had varying degrees of success which, to be understood, should be analyzed within the overall framework of the industry and the general economic and social structure of each country.

A general principle seems to apply to all the region as a basic rule for the success of a development policy: the need for the integration of the small individual fisherman in an organization in which he can develop to the maximum his full capacity for invention and leadership within a social framework of Government assistance favorable to the improvement of welfare conditions, technical training and credit and insurance facilities.

Lack of good fisheries extension services constitutes one of the most serious deficiencies in the region; also the number of professional fishermen and competent technicians in fisheries is inadequate for the technical development required by the industry.

Both of these two problems could be faced through the improvement of the basic fishermen's organizations. In fisheries, more than in any other activity, labor is the most precious investment object.

B. PROJECTS AND PROSPECTIVES OF FISHERIES

DEVELOPMENT IN THE REGION: COUNTRY'S APPRAISAL

The interest now shown in the development of the fisheries industry in Latin America is of recent date. War emergency policies designed to relieve food scarcities in the home markets of many Latin American countries and the exclusion of traditional fish-supplying countries such as Norway, Japan and Portugal from world markets created incentives for the development of local fisheries which, up to World War II had only played a secondary role in the economy of the region. The speedy development during war and in post-war years has already been illustrated by examples from the fisheries of Peru, Venezuela, Costa Rica and Chile. There is really a clear and interesting illustration of the influence which external factors played in the creation, almost overnight, of industries which as far as the wealth of the marine resources is concerned, could have been developed long ago. Brazil shows a typical example of how war-time food restrictions in home markets created incentives for a more intensive fisheries production in certain sections of the primary and secondary industries. In fact, with the exception of dried and salted cod which has always been a major fisheries import item in the country and one difficult to substitute for from domestic production, the Brazilian market is at present being supplied by local production of cured and canned fish which, before the war, was made available mainly through import channels.

The social and economic impact of the war on the fisheries development of the region clearly shows the importance to the implementation of fisheries projects of external as well as internal factors within the framework of the country's overall economy. It is obvious, but unfortunately not always well understood, that a fisheries development policy is more than a skilled combination of natural resources and technological methods of exploitation. Fish has an economic value because it enters the market and supplies an economic need. As such fish production is always dependent on the complex inter-play of the economic laws which regulate production and consumption for the whole community. A full understanding of these factors in the implementation of a fisheries development program is just as important as a realistic survey of fishery resources or an appraisal of technological methods of production. Without such an understanding the natural resources either lie unproductive or they are exploited on a basis which may not give the "optimum" economic returns.

Summarizing the conclusions reached in the first section of this paper we have noted low productivity per fisherman, defective techniques in marketing and transportation, consumer discrimination in favor of other foodstuffs, availability of other sources of food supplies competitive in price and nutritional value with fishery products such as meat and vegetables, and, principally, the inadequate purchasing power of the lower income groups of the population. These are the main economic causes of the low level of fish production observed in the region.

There are some focal points in the region where a large industrial exploitation of the fisheries resources, based on the existing economic and social structure, has met with notable success. From the standpoint of the individual countries, these relatively developed centres of fisheries production may represent only a very small part of the potential fisheries development of the countries concerned. Nevertheless, they are already an important source of food supply from a regional, or even an international point of view, and as such they have to be considered as the main nucleus for the implementation of fisheries projects in the less developed national areas.

It is expected that these relatively small, and widely scattered, centers of fisheries development in Latin America will, in the near future, play a dominant role in the spreading of technical skill and capital to areas whose possibilities have hitherto been neglected. Actual landing statistics in the countries in which these centers are located - Brazil, Chile, Mexico, Peru and Venezuela, show an increase of 315,000 metric tons, or about 176 per cent over their pre-war landings. This spectacular development contributed 89 per cent of the total increase in Latin American landings which occurred between pre-war and 1951. It is important to note that such a significant rate of increase in the production of fish chiefly for human consumption compares favorably with the highest rates achieved in any other region of the world, irrespective of its stage of initial development. This may indicate that, given the right social and industrial structure for a well balanced fisheries development, the region has large possibilities for the economic exploitation of marine and inland resources which, although capable of yielding four or five times the actual production of the area, are at present largely unproductive.

A brief account of the current fishing developments underway in these developed areas will be the starting point to evaluate the progress made towards the increase of food production in the region, since they account for more than four-fifths of the total fish production of all the Latin American countries.

Brazil has increased its landings in past years from 150,000 metric tons in 1947 to an estimated 160,000 in 1952. Since 1951 the fishing fleet operating in the Central and southern areas has been expanding considerably in the number and efficiency of the units used. To increase fish production in the central and southern parts of the country, and to train local fishermen in the use of modern fishing methods, the Fishing Industry Bank of Credit of Brazil, an executive agency under the Ministry of Agriculture, is at present financing the acquisition of modern fishing boats by private companies. It is expected that the power and efficiency of these new fishing units will make possible a substantial increase in the landings within the area in 1953. New shore facilities, including a new freezing plant under construction on the island of Coqueiros Florianopolis (State of Santa Catarina), as well as improved market outlets in Sao Paulo and Rio de Janeiro, will absorb the anticipated increase in primary production. The fish processing industry is still in a rather undeveloped state, both as regards standards of quality and volume of production. We may say that at a rather conservative estimate, around 40 per cent of the cured products produced all over the country result solely from the small scale processing carried out by inshore fishermen. This situation points quite clearly to the new lines of development which lie ahead for the expansion of the industry in the north and north west part of the country, viz:- technical improvements in the small scale salting and drying industries scattered along the coast, coupled with new facilities for the trade in fresh and cured fish, based on the balanced and step-by-step improvement of the primitive catching techniques still practised in the area. This development, to be successful, has to take into consideration the need to raise the actual low catch productivity per fisherman to a level compatible with a pattern of demand which is mainly dictated by the low purchasing power of the population.

Chile is the second largest fish producer in Latin America. In the period 1947/51 landings of fish and shellfish increased by about 86 per cent from 50,000 metric tons to 93,000 metric tons. This reflects the steady increase in fishing capacity since 1947 and in fact the latter now exceeds present levels of production since the arrival in 1950 and 1951 of 14 German trawlers fishing for Merluza, with average yields of about 2,400 metric tons yearly. With the motorization of the Chilean fishing fleet, production is planned to increase in step with higher consumption levels.

The officially sponsored plan which is under way for the expansion and improvement of the fishing industry contemplates an investment equivalent to US $3,720,000 for establishing shore facilities and modernizing fishing craft and gear.

The secondary industry is well developed in the center and the north of the country, but inadequate cold storage and transportation facilities limit the distribution of fresh fish. The meat crisis has recently directed attention to fish as an available substitute for meat and plans have been announced for improving refrigerated storage and transportation facilities. The main lines of future development lie in the reduction of production costs and market prices for fresh fish and expanding the output of dried fish of high quality in order to meet the large potential demand represented by the sections of the population with lower incomes which up to now have not been able to absorb the increased output from a primary industry in process of expansion.

An educational campaign has been carried out by an FAO expert under the Technical Assistance Program in an effort to popularize and increase fish consumption.

The fishing industry in Mexico is landing annually around 60,000 metric tons of fish and shellfish from the Pacific and the Gulf of Mexico coasts. In addition to the domestic catch there is also the fishing under licence by foreign craft in Mexican waters which produces some 60,000 metric tons annually, mostly tuna.

Mexico's fishing fleet is badly in need of modernization, as most of the units are old and inefficient. The total tonnage has increased very little in recent years and the fleet is made up of around 6,000 craft of all types with 82 per cent of one to three register tons. At present, a special commission of the Mexican Navy Department is working on a project for the construction of two small fishing fleets as soon as possible - one for the Gulf of Mexico and the other for the Pacific Coast. The secondary industry operating in the Pacific area, in the Gulf of Mexico and the States of Sonora, Sinaloa, Baja California and Campeche is up-to-date as regards technical methods in use at the freezing plants and canneries. The industry, being strongly dependent on the U.S. markets for its output, is liable to be affected by any protective tariffs which, in the future, may result from the pressure of the U.S. fishing industry which is meeting competition in the home market from the Mexican frozen and canned tuna products.

The attempts which, at present, are being made by the industry and the Government to expand the internal market through an overall organization of the present ineffective system of distribution, transport and marketing of fish appear to offer the only rational answer to the industry's external marketing problems. On the other hand, such a policy would help substantially to improve the food supply situation considering that the consumption of fish in Mexico hardly reaches 750 grams per person annually, although the potential supplies of fish and shellfish would be sufficient to provide more than 30 kg. per person.

In ten years the landings of fish and shell fish in Peru increased from 10,000 metric tons annually in 1942 to the present level of around 105,000 metric tons. This tenfold increase in fish production was mainly due to an increase in demand for fish in the urban centers, especially Gran Lima, and to the fact that U.S. and many European markets showed a growing interest in the Peruvian canned and frozen products.

The secondary industry, the bulk of which consists of freezing plants and canneries, is absorbing about 64,000 metric tons annually, which represents 60 per cent of total supplies. To serve this large industrial set-up there is a fleet of 3,000 boats, 600 of which have motor-power.

The shore facilities are not yet fully equipped to handle the increased catches. Several shipyards are kept in full activity (the cati-craft in Chucutito are launching 10 "lanchas" per day) and motorization of the old fleet is underway.

As is the case in Mexico, the industry is actually working and expanding on the basis of the strong demand for its products in the U.S. and in certain European markets. This might constitute in future a weak point in the commercial structure of the industry unless the home markets are expanded and organized in order to absorb surpluses. The present fish consumption in Peru is still very low compared with other developed Latin American fishery countries such as Chile or Venezuela and recent estimates point to the possibility of doubling the per capita consumption on the basis of known resources and the production capacity of the industry.

The fishing industry of Venezuela, although it has shown a considerable capacity for increasing its catches since the war, has not yet achieved the level of a modern, well-balanced commercial organization. A relatively high dollar income, low taxes and strong dependence on imported food products make, nevertheless, Venezuela one of the more important South American outlets for processed fish products. The domestic catch increased from 22,000 metric tons before the war to 92,000 metric tons in 1948 and 78,000 metric tons in 1950, in an effort to meet the home shortages of basic commodities such as meat, flour, beans, rice and oils and, also, to profit by the prospects, revealed during the war, for expanding the foreign markets for canned and frozen products in neighbouring countries. The import of fish products, mainly canned sardines from U.S., has been a source of keen competition for the national canning industry.

The Venezuelan Development Corporation is responsible for carrying out an ambitious plan for the modernization and expansion of the fishing fleet, port and shore facilities, market outlets, and fishermen's welfare services. Plans for further expansion of the fleet are underway but the peculiar economic structure of the country seems to have been working against a profitable economic exploitation of these undertakings.

The remaining areas of the Latin American continent, which have been classified for our purposes of analysis as being still in a relatively under-developed stage of technological and/or economic exploitation of their fisheries, belong to countries with marine and inland resources, such as Argentina, Ecuador, Colombia, Uruguay, the British, French and Dutch Guineas, and all the Central American and Caribbean Republics and territories, or countries with only inland resources, such as Bolivia and Paraguay. This rather arbitrary line of separation has been drawn mainly because of the low contribution which these countries make to the total catches of Latin America and which in 1951 were approximately 125,000 metric tons, or less than 20 per cent of the total. With a few exceptions, this accounts in part for the low levels of technical productivity and the rather inefficient and backward methods of distribution and marketing of fish still prevailing in most of these countries. With the exception of Uruguay and Argentina, the remaining countries display a common standard of fisheries development which can be summarized as follows:

The total catch of the area in which the countries and territories dealt with below are included was about 30,000 metric tons in 1951 as compared with about 7,000 metric tons pre-war.

A fisheries conference held in Trinidad in March 1952 by the Caribbean Commission attended by delegates from French, Dutch, British and U.S. possessions, studies in detail the present conditions and problems of the fisheries of these territories.

Among its recommendations priority was given to production and to the evaluation of fishery resources. It was found that there is a need for research on production potentialities as well as long range planning with regard to marketing outlets. The Territorial Governments were recommended to give urgent consideration to the removal of import duties on fishing equipment as well as to the organization of cooperative activity in respect of marketing, credit and savings, purchase of gear, and insurance.

Outboard and inboard motors have lately been introduced. However, there is a lack of docking facilities, cold storage units and ice plants as well as of insulated vehicles for the distribution of the catch. The construction and purchase of these facilities were recommended with the idea of increasing production and consumption. The possibilities of processing fish were not taken into serious consideration in view of the unavailability of a constant supply of fish.

The distribution and preservation of fish in Ecuador are rather primitive and are hampering the development of the fisheries in the country. The lack or roads makes the distribution inland (Sierra) very difficult and most of the fish are consumed in the maritime provinces.

An FAO fisheries expert has estimated that the total production of fish for domestic consumption is 9,000 metric tons. Around 46 per cent of this amount is sold fresh without any other means of preservation save the occasional use of crushed ice. 48 per cent is sold salted and consumed mostly inland together with the remaining 6 per cent, which is dried.

Colombia, Panama, Costa Rica, Nicaragua, Honduras and Guatemala have a great variety of fishery resources, in view of their location between two different bodies of water, the Caribbean Sea and the Central Pacific. This variety of fishery resources, however, makes the development of their fisheries highly complex.

Colombia has been trying to develop her fisheries concurrently under two plans; the Pacific and the Atlantic. These plans are administered by a government sponsored company, the ICOPESCA (Industria Colombina de Pesca Maritima S.A.).

An expansion of the fishery industry will, however, require better knowledge of the fishery resources, particularly along the Pacific coast where they are very little known. It will also require a well organized fishing company to develop the fish production and trade.

The fishery industry of the six Central American Republics, (although El Salvador does not have a Caribbean coast it is considered here with the other five Republics in view of the similarity of its fishery problems in the Pacific), is rather underdeveloped. However, the spectacular results of the high seas tuna fisheries off Western Central America have stirred the interest of the Republics toward the development of their fishery resources.

Costa Rica, which has been the most active Central American country in the development of her fishery resources, is at present developing a primising shrimp fishery.

The government of this country is much interested in developing a fishery for domestic consumption and plans are being made to improve the operation of a refrigeration plant existing there, and for the acquisition of boats to fish for domestic consumption.

Panama has also started a shrimp fishery but the prevailing catch cannot be used as an indication of the potentiality of this resource. It is, however, exceeding the local demand and frozen shrimp has been sold to the United States.

The government of El Salvador has recently acquired several modern fishing boats in the United States, to develop a fishery industry to serve the domestic demand. The promising results already obtained point to the need for establishing a fishery industry for domestic consumption and local private concerns are showing interest.

Although Paraguay and Bolivia do not have marine resources such as the other Latin American countries, there are probably enough potential fishery resources in their rivers and lakes to meet the needs of their populations.

Finally, in our classification of fisheries in underdevelope countries, notwithstanding their large potential fishery resources and an up-to-date market organization for the distribution and preservation of perishable meat products - so alike in certain technological and economic aspects to fish - are the Southern American Atlantic countries of Uruguay and Argentina. For both of these countries the main problem restricting the growth of the fishery industry is that of expanding an internal market which, by reason of strong consumer preferences and large abundance of other competitive foodstuffs, shows a relatively low per capita consumption of fishery products. Moreover, Argentina and Uruguay have almost unique advantages in that their per capita incomes are amongst the highest in the region and they already possess the initiative, skill and capital means required to develop the industry on the basis of a potential domestic market.

A successful line of development of the fishery industry in these two countries can only be based on a well balanced and coordinated plan, in which a campaign to promote increased fish consumption will be the determining factor in raising the industry from its present low level of productivity to a more healthy economic position.

The above outline of the main developments underway and planned for the fisheries of the region show that the field is now open in these countries for the extension of fishing operations which are only localized at present to a wide area containing marine and inland resources to which, so far, only primitive and unproductive techniques have been applied.

The FAO Second World Food Survey of November 1952 drew attention to the need for a 26 per cent increase in the gross supplies of fish over the recent Latin American levels in order to meet certain immediate targets calculated to provide for a realistic improvement in the nutritional standards of the estimated 1960 population of the region. This 26 per cent target increase taken as an average for the whole region of course hides the uneven distribution of natural resources and the wide range of social and economic structures in fish production, marketing and consumption which occur in Latin America. It shows, nevertheless, that it is a rather practical venture if we note that countries which are contributing up to 80 per cent of the present fish production in the region (Brazil, Chile, Peru, Mexico and Venezuela) have increased their landings of fish in the region by 315,000 metric tons since the pre-war period, while their level of fish supplies per head is comparatively very low at present if we compare it with the level of supplies for other competitive foodstuffs such as meat, which are weighing heavily in their foreign trade balances. There are countries with maritime resources still waiting to be exploited on a large scale, such as Ecuador, Colombia, Central America and the Caribbean area, which nevertheless show a very low per capita consumption of fish, with nutritional levels and standards of living badly in need of cheap protein supplies. These countries could, with the right economic policies, expand the natural market for fresh and salted fish products on the basis of improved marketing and transport facilities, better quality standards of fresh and processed products and a comparable expansion

and improvement of their fishing fleets. There are two countries, Argentina and Uruguay, which, although being predominantly meat consuming countries, already have the necessary commercial experience and the marketing organizations for the industrialization and handling of perishable foodstuffs such as fish. Nevertheless, they have so far failed to exploit on a large scale their abundant marine and inland resources and fish consumption and production could be substantially increased in the near future through consumer-educational measures and coordinated policies intended to bring private and public investments into the industry for the expansion of the fishing fleet, shore facilities, market outlets and the secondary industry, mostly in the sections of canned products and oil and meal undertakings.

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C. SUMMARY OF CONCLUSIONS

Latin America as a whole has, since the end of World War II, shown steady progress in the development of its fisheries. Certain restricted areas in the region are already the nucleus of a large fisheries industry, while the remainder of the region is still at an elementary stage of economic development, where primitive techniques and small scale production prevail. Productivity per fishermen is low in the less developed areas. Although considerable progress has been made during the post-war years in the renewal, mechanization and expansion of fishing fleets and gear in the region, the low average rates of productivity per fisherman show that much has still to be accomplished in the way of improvements in fishing methods in the less developed areas. Large-scale mechanization nevertheless calls for impressive levels of capital investment and will weigh heavily in costs of production if mass demand has not been previously secured.

Social and credit schemes for the benefit of the small producers in the region, leading to improved welfare conditions of fishermen, coupled with sound policies of small-scale mechanization on the basis of the existing types of craft and gear, may result in a substantial raising of the existing low levels of productivity in these areas.

The organization of fishermen in cooperatives has also proved to be one of the best institutional settings for the efficient exploitation of fishery resources and in the marketing of catches when it receives the necessary Government assistance and is not hindered by lack of managerial initiative.

The growth of fisheries production in the region is being hampered by the lack of rational marketing organization and the inadequacy of the existing transport system for the distribution of perishable foodstuffs. High costs of distribution, coupled with the prevailing deficiency of purchasing power in the lower income groups of the population are the factors chiefly responsible for the low per capita fish consumption levels observed in the region. This situation could be substantially improved if irregularities of supply were eliminated and fish made available daily at the consumer centres in sufficient quantity, of good quality, and at prices which were within the means of all consumers. The increased availability of salted and/or dried fish products in inland territories and among the low income groups of the urban centres would help substantially to improve the food situation in those areas and provide the much needed outlet for seasonal surpluses which are not fully absorbed by the fresh fish markets. In the urban centres new market outlets for fresh fish could be easily obtained by extending the existing cold storage facilities, and by consumer education programmes designed to promote the wider consumption of fresh fish, either whole or in the form of fresh or frozen fillets. In many cases consumption is still discouraged by the insanitary conditions in which fish is displayed in the markets, due mainly to lack of the use of ice preservation techniques which are required during catching and distribution operations.

Canned products have not yet found a large place in the domestic market, mainly because prices are high and the final product is of a quality inferior to the competitive products imported from the traditional European and North American suppliers.

The trade restrictions which, since 1949, have limited to a great extent the free flow of commodities into the old-established markets for fisheries products have substantially affected the export trade of the more industrialized producer countries in the region. The attempts which are at present being made in those countries to expand their domestic markets seem to be the only rational means of relieving the industry from the present critical situation.

The initial stage of economic development still prevailing in the industry, and the existing low levels of earnings among the large majority of producers, causes the accumulation of capital within the industry to lag far behind the actual capital investments needed for the improvement and expansion of equipment in the primary and secondary production. Only through large-scale financing by the Government, other private sections of the economy, or by foreign investments, can the fishing industry in the region expand in the future to a level compatible with the potential needs of the domestic markets and the unused wealth of the natural resources.

APPENDIX

STATISTICAL TABLES

Symbols used in tables

-	Nil, zero
∅	Negligible
...	Not available
*	Estimated

TABLE 1 - LATIN AMERICA: Total annual landings of fish, crustaceans and molluscs, by country, 1938 and 1947-51 (Estimated or recorded) 39

Region and country	PREWAR		POSTWAR				
	Year	Quantity	1947	1948	1949	1950	1951
		(..... Metric tons .....)					
Mexico	1938	18 700	55 500	49 400	*55 000	*55 000	*70 000
America, Central							
British Honduras	1942	300	...	100	100	100	100
British West Indies							
Bahamas	1939	800	...	1 000	1 000	1 000	1 000
Barbados	1940	500	...	...	...	...	...
Jamaica	...	...	5 500	...	...	...	...
Leeward Islands	...	...	2 100	...	...	...	...
Windward Islands	...	...	5 600	...	...	...	...
Costa Rica	1938	*1 450	*2 200	*2 300	*2 500	*2 500	*2 500
Cuba	1938	18 000	9 200	8 300	9 500	9 800	*10 000
Dominican Republic	1938	300	500	500	600	630	*650
El Salvador	1938	*100	*400	*400	*400	*400	*400
Guadeloupe & Martinique	1938	400	...	...	...	...	...
Guatemala	1938	*100	*200	*200	*250	*250	*250
Haiti	1938	*1 500	*1 500	*1 600	*1 800	*2 000	*2 100
Honduras	1938	*100	*100	100	100	100	*100
Netherlands West Indies	1938	100	100	100	100	100	200
Nicaragua	1938	*100	*100	*100	*100	*200	*200
Panama	1938	*700	*800	*900	*1 000	*1 000	900
Puerto Rico	1930	1 400	1 500	...	...	*2 100	*2 500
St. Pierre & Miquelon	1938	*800	*800	*800	*800	...	...
America, South							
Argentina	1938	55 300	65 100	71 200	63 900	*65 000	*76 870
Bolivia	1938	*700	*800	*800	*900	*900	*900
Brazil	1939	103 800	139 700	144 800	152 600	*155 000	*160 000
British Guiana	1938	2 000	2 200	*2 000	*2 000	...	...
Chile	1938	30 600	60 100	64 700	76 200	86 700	93 000
Colombia	1938	*10 000	*10 000	*15 000	*16 000	*[illegible]00	*16 000
Ecuador	1938	*1 800	*2 800	*3 400	*5 000	*10 000	*10 000
French Guiana	...	...	...	*2 400	*3 000	...	...
Paraguay	1938	*300	*400	*400	*400	*400	*400
Peru	1939	4 800	36 600	47 700	60 800	83 600	105 550
Surinam	1938	400	500	500	500	800	1 000
Uruguay	1938	3 600	3 500	3 500	3 800	*4 000	*4 200
Venezuela	1938	21 700	76 200	92 300	75 400	78 300	*75 000

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TABLE . 2 - LATIN AMERICA: Landings by species groups in 5 countries

	Year	Total	Fresh-water species	Teleos-tean flat-fishes	Cod, hake & similar species	Herring & similar species	Tunas, true mackerel & similar species	Barracudas, mullets & similar species	Jacks pompanos & similar species	Perches, croakers, breams, basses & similar species	Other marine teleos-teans	Elasmo-branchs	Crusta-ceans & mollusks	Other
		(. . . . . Metric tons . . . . .)												
Argentina	1945	54 188	15 368	60	9 408	3 017	3 526	1 097	805	10 057	...	8 646	760	1 444
Brazil 1/	1950	71 527	483	139	965	20 194	144	3 080	694	10 918	4 504	1 652	2 709	2/ 26 045
Chile	1950	86 723	-	360	33 105	14 958	9 889	882	1 368	3 024	5 286	427	15 664	1 760
Mexico	1946	53 029	73	6	-	12 909	3 115	1 114	289	7 460	245	2 184	20 801	2/ 4 833
Peru	1950	83 641	-	66	-	6 553	54 393	551	1 194	7 798	181	1 290	3/ 1 493	2/ 10 122

1/ Data referring to the States of S. Paulo, Rio Grande de Sul and the Federal District of Rio de Janeiro, only. The total landings for these 3 areas corresponds to 4.5 percent of the total landings in Brazil.

2/ Includes species presumably belonging to other groups specified in this table.

3/ Includes small quantities of other species.

TABLE 3. - LATIN AMERICA: Utilization of landings, in 7 countries, 1949-51

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	Year	Landings	Fresh or Frozen	Cured	Canned	Other
		(..... ...	..... Metric tons			.....)
TOTAL	1951	590 458	290 357	99 930	131 383	68 783
	1950	548 623	266 633	100 204	119 666	62 120
Argentina	1951	*76 870	45 325	9 733	12 000	9 812
	1950	*65 000	32 822	7 016	8 570	16 592
	1949	63 900	38 152	7 893	9 645	8 210
Brazil	1951	*160 000	74 000	56 200	29 000	800
	1950	*155 000	71 152	56 069	26 939	840
	1949	152 600	89 364	47 125	15 691	420
Chile	1951	93 037	49 681	597	15 383	27 376
	1950	86 723	50 479	1 219	13 517	21 508
	1949	76 246	48 285	1 301	12 973	13 687
Ecuador	1951	*10 000	4 600	5 400	-	-
	1950	*10 000	4 600	5 400	-	-
	1949	*5 000	2 300	2 700	-	-
Mexico	1951	*70 000	37 200	4 000	27 000	1 800
	1950	*70 000	37 200	4 000	27 000	1 800
	1949	*60 000	31 350	4 000	23 000	1 650
Peru	1951	105 551	45 551	5 000	35 000	20 000
	1950	83 600	40 880	4 500	32 640	5 580
	1949	60 800	...	...	...	...
Venezuela	1951	*75 000	34 000	19 000	13 000	9 000
	1950	78 300	29 500	22 000	11 000	15 800
	1949	75 400	34 100	20 400	10 000	10 900

TABLE 4. - LATIN AMERICA: Production per fisherman in 15 selected countries

Countries	Year	Landings in metric tons	Number of fishermen	Production per fisherman in metric tons
Argentina	1951	76 870	5 000	15
Brazil	1950	160 000	150 000	1
Chile	1950	93 000	7 500	12
Cuba	1951	10 000	9 000	1
Dominican Republic	1945	342	1 211	ø
Ecuador	1951	10 000	6 200	2
Guatemala	1947	135	200	
Haiti	1948	1 600	4 000	ø
Honduras	1946	135	200	1
Mexico	1951	70 000	12 000	6
Nicaragua	1947	100	150	1
Panama	1946	850	529	2
Peru	1950/51	105 550	8 000	13
Uruguay	1949	3 800	400	10
Venezuela	1949	75 000	22 300	3

TABLE 5 - LATIN AMERICA: Computation of retention and per capita consumption of edible fishery products, average 1949-51

Countries	Landings	Imports	Exports	Retention	Population Average 1949-51	Per capita consumption
	(..... Metric tons .....)				(Thousands)	(Kilograms)
LATIN AMERICA: TOTAL	577 741	163 604	47 317	694 028	148 238	4.7
Argentina	*68 590	*823	*823	68 590	17 131	4.0
Bolivia	*900	*960	-	1 860	3 354	0.5
Brazil	*155 867	*82 260	*7	238 120	51 617	4.6
Chile	85 300	52	1 149	84 203	5 810	14.5
Colombia	*16 000	*1 119	6	17 119	11 180	1.5
Costa Rica	*2 500	*682	*155	3 027	821	3.6
Cuba	*9 767	47 426	1 095	56 098	5 343	10.5
Dominican Republic	*533	*10 382	-	10 915	2 188	5.0
Ecuador	*8 333	*1 445	*441	9 337	3 186	2.9
El Salvador	*400	1 011	-	1 411	1 976	0.7
Haiti	*1 967	*7 360	-	9 327	3 325	2.8
Honduras	*100	*284	*193	191	1 455	0.1
Mexico	*66 667	1 234	25 533	42 368	25 383	1.6
Nicaragua	*167	*165	-	332	1 108	0.3
Panama	*967	*1 787	*127	2 627	795	3.3
Peru	83 317	*593	*16 205	67 705	8 389	8.1
Surinam	133	2 021	-	2 154	210	10.3
Venezuela	*76 233	*4 000	*1 589	78 644	4 967	15.8

NOTE: For the purpose of this table imports and exports quantities have been converted to landed weight in order to have a common basis to work out retention and per capita consumption.

TABLE 6 .- LATIN AMERICA: Per capita consumption of edible fishery products, by commodity groups, in 7 countries

	Fish fresh or frozen 1950	Fish, cured 1950	Fish, canned 1950	All edible fishery products 1949-51 1/
	(..... Kilograms .....)			
Argentina	1.9	0.5	0.5	4.0
Brazil	1.3	2.8	0.5	4.6
Chile	8.6	0.2	2.2	14.5
Ecuador	1.5	1.8	0.6	2.9
Mexico	1.4	0.2	1.1	1.6
Peru	3.8	0.6	2.4	8.1
Venezuela	5.8	4.6	2.5	15.8
TOTAL 2/	2.2	1.6	0.9	5.1

1/ Figures taken from table.

2/ The total is not the arithmetic average of the figures of the 7 countries appearing in this table, but is obtained from the total retention of these 7 countries divided by their total population.

TABLE 7.- LATIN AMERICA: Retention and per capita consumption of edible fishery products and meat, in six countries, pre-war and 1949.

Countries	Period	Retention of fish	Retention of meat	Per capita consumption of fish	Per capita consumption of meat
		(.....Metric tons ...)		(..... Kilograms .....)	
Argentina	Prewar	75 000	1 508 000	6	107
	1949	64 000	1 881 000	4	114
Brazil	Prewar	154 000	1 921 000	4	50
	1949	221 000	1 908 000	5	39
Chile	Prewar	31 000	176 000	7	38
	1949	75 000	211 000	13	38
Colombia	Prewar	11 000	223 000	1	26
	1949	16 000	312 000	2	29
Cuba	Prewar	50 000	144 000	11	33
	1949	51 000	184 000	10	35
Venezuela	Prewar	25 000	...	7	...
	1949	*77 000	102 000	16	21

TABLE 8.- LATIN AMERICA: Value of imports of fisheries products, 1938 and 1947-51

		1938	1947	1948	1949	1950	1951
		(..... Thousand U.S. dollars 1/ .....)					
LATIN AMERICA:	TOTAL	8 993	26 316	26 530	25 966	30 532	...
North:	Total	405	1 367	1 077	339	222	1 175
Mexico		405	1 367	1 077	339	222	1 175
Central:	Total	2 305	10 535	9 891	9 515	10 031	...
Costa Rica		131	305	293	260	43	...
Cuba		1 613	8 344	7 372	7 019	7 399	8 538
Dominican Republic		211	740	971	810	891	...
El Salvador		33	198	134	343	374	447
Haiti		193	393	685	673	*741	...
Honduras		...	134	120	108	*115	...
Nicaragua		-	110	51	44	90	...
Panama		124	311	265	258	378	...
South:	Total	6 283	14 414	15 562	16 112	20 279	...
Argentina		1 976	...	...	...	...	...
Bolivia		15	56	40	28	*39	...
Brazil		2 718	10 527	12 218	13 346	16 238	...
Chile		150	126	75	90	62	...
Colombia		471	1 842	827	166	1 001	...
Ecuador		45	255	202	279	339	...
Peru		272	385	349	103	300	...
Venezuela		636	1 223	1 851	*2 100	*2 300	...

1/ For conversion factors used in this table see: Direction of International Trade, supplementary issue, January-April, 1952. (Statistical office of the United Nations - International Monetary Fund - International Bank for Reconstruction and Development).

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TABLE 9.- LATIN AMERICA: Value of exports of fisheries products, 1938 and 1947-51

		1938	1947	1948	1949	1950	1951
		(..... Thousand U.S. dollars 1/ .....)					
LATIN AMERICA:	TOTAL	4 900	30 577	47 918	47 729	53 510	...
North:	Total	3 114	23 086	40 687	40 519	44 588	33 190
Mexico		3 114	23 086	40 687	40 519	44 588	33 190
Central:	Total	1 256	2 934	2 694	1 735	1 887	1 154
Costa Rica		470	984	871	149	95	...
Cuba		784	1 839	1 759	1 543	*1 589	1 154
Dominican Republic		-	-	-	-	-	...
El Salvador		ø	ø	ø	ø	ø	ø
Haiti		ø	3	2	...	...	...
Honduras		2	8	12	12	*15	...
Nicaragua		...	28	40	25	17	...
Panama		...	72	10	6	171	...
South:	Total	530	4 557	4 537	5 475	7 035	...
Argentina		229	...	...	...	...	...
Bolivia		-	-	-	-	-	...
Brazil		18	58	3	47	33	...
Chile		47	1 082	1 060	811	514	...
Colombia		73	74	25	27	25	...
Ecuador		-	-	-	-	-	...
Peru		4	2 611	2 842	3 890	5 763	...
Venezuela		159	732	607	*700	*700	...

1/ For conversion factors used in this table see: Direction of International Trade, supplementary issue, January - April 1952 (Statistical Office of the United States - International Monetary Fund - International Bank for Reconstruction and Development.)

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TABLE 10. - LATIN AMERICA: Imports and exports of fishery products, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

		IMPORTS						EXPORTS					
		1938	1947	1948	1949	1950	1951	1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	57 048	52 982	51 131	52 767	64 102	...	37 159	92 509	109 141	126 525	158 571	...
	1/V	8 617	25 915	25 922	25 634	30 246	...	3 817	28 834	45 918	46 022	52 412	...
FISH, FRESH OR FROZEN: TOTAL	Q	1 298	931	592	304	350	...	30 026	70 905	82 927	90 082	122 326	...
	1/V	129	10	32	20	46	...	3 301	18 892	32 711	31 320	37 388	...
America, North													
Mexico	Q	-	6	35	13	32	69	26 456	67 685	78 354	86 831	112 190	68 553
	V	-	4	19	7	18	33	2 797	17 739	31 545	30 617	35 606	20 929
America, Central													
Costa Rica	Q	1	-	ϕ	ϕ	ϕ	ϕ	3 364	1 754	2 759	-	-	...
	V	ϕ	-	ϕ	ϕ	ϕ	ϕ	454	404	677	-	-	...
Cuba 2/	Q	65	ϕ	18	32	50	75	5	ϕ	18	21	257	45
	V	10	ϕ	6	11	23	32	1	ϕ	10	10	66	16
Dominican Republic	Q	-	-	ϕ	1	-	...	-	-	-	-	...	...
	V	-	-	1	1	-	...	-	-	-	-	...	...
El Salvador 3/	Q	...	...	...	...	...	...	...	...	...	...	...	...
	V	...	...	...	...	...	...	...	...	...	...	...	...
Haiti	Q	2	ϕ	2	2	*2	...	-	-	-	-	...	...
	V	ϕ	ϕ	1	1	*1	...	-	-	-	-	...	...
Honduras	Q	...	-	ϕ	ϕ	*ϕ	...	-	-	-	-	-	...
	V	...	-	ϕ	ϕ	*ϕ	...	-	-	-	-	-	...

TABLE 10 (cont'd)

		IMPORTS						EXPORTS					
		1938	1947	1948	1949	1950	1951	1938	1947	1948	1949	1950	1951
FISH, FRESH OR FROZEN (concluded)													
America, Central (concluded)													
Nicaragua	Q	*0	0	0	0	0	...	-	-	-	-	0	...
	V	*0	6	0	0	0	...	-	-	-	-	0	...
Panama	Q	-	-	-	-	-	...	...	1	-	-	1	...
	V	-	-	-	-	-	...	...	0	-	-	0	...
America, South													
Argentina	Q	921	746	436	160	166	...	95	174	333	275	351	...
	V	115	...	...	...	...	...	19	...	...	...	...	...
Bolivia 4/	Q	309	179	101	96	*100	...	-	-	-	-	...	...
	V	4	6	5	3	*4	...	-	-	-	-	...	...
Brazil	Q	-	-	-	-	-	...	-	11	-	18	-	...
	V	-	-	-	-	-	...	-	4	-	15	-	...
Chile	Q	-	-	0	-	-	...	62	811	514	75	221	...
	V	-	-	0	-	-	...	11	429	260	31	63	...
Colombia	Q	-	0	0	-	-	...	-	-	-	-	-	...
	V	-	0	0	-	-	...	-	-	-	-	-	...
Peru	Q	-	-	-	-	0	...	0	232	712	2 612	9 106	...
	V	-	-	-	-	0	...	0	37	138	517	1 533	...
Venezuela 5/	Q	-	-	-	-	-	...	44	237	237	*250	*200	...
	V	-	-	-	-	-	...	19	105	81	*130	*120	...
FISH, CURED: TOTAL	Q	36 868	36 625	39 103	42 630	48 085	...	482	1 159	548	407	340	...
	1/V	4 807	16 628	18 424	20 513	23 145	...	83	327	150	112	65	...
America, North													
Mexico 6/	Q	439	588	...	...	...	...	186	54	102	110	81	57
	V	102	448	...	...	...	...	31	42	53	41	22	18

TABLE 10 (cont'd)

		IMPORTS						EXPORTS					
		1938	1947	1948	1949	1950	1951	1938	1947	1948	1949	1950	1951
FISH, CURED (cont'd)													
America, Central													
Costa Rica	Q	221	68	101	58	56	...	-	13	4	-	...	...
	V	31	26	54	33	25	...	-	3	1	-	...	...
Cuba 2/	Q	9 032	11 237	10 893	12 098	11 876	14 109	4	9	14	3	3	1
	V	971	5 283	4 776	5 250	4 602	5 371	2	18	18	5	5	1
Dominican Republic	Q	1 941	2 244	3 196	2 659	3 455	...	-	-	-	-	...	...
	V	196	703	930	775	860	...	-	-	-	-	...	...
El Salvador 3/	Q	124	276	196	730	942	856	1	1	ø	ø	1	2
	V	33	176	117	318	351	420	ø	ø	ø	ø	ø	ø
Haiti	Q	2 426	1 787	3 594	3 901	*4 000	...	-	-	-	-	-	...
	V	186	371	667	634	*700	...	-	-	-	-	-	...
Honduras	Q	...	20	20	21	...	...	-	11	42	50	*60	...
	V	...	18	16	17	...	...	-	2	6	8	*10	...
Nicaragua	Q	...	...	...	...	3	...	-	-	-	-	-	...
	V	...	...	...	...	2	...	-	-	-	-	-	...
Panama	Q	515	319	334	332	447	...	-	-	1	-	ø	...
	V	65	137	142	144	193	...	-	-	1	-	ø	...
America, South													
Argentina	Q	5 625	4 060	878	ø	345	...	271	229	122	77	78	...
	V	821	...	...	...	...	...	46	...	...	...	...	...
Bolivia 4/	Q	...	...	...	...	...	...	...	...	...	...	...	...
	V	...	...	...	...	...	...	...	...	...	...	...	...
Brazil	Q	15 347	15 166	18 906	21 612	25 707	...	14	ø	-	-	-	...
	V	2 282	9 381	11 559	13 029	15 942	...	3	ø	-	-	-	...
Chile	Q	117	11	6	1	7	...	1	790	254	159	115	...
	V	29	5	4	1	4	...	ø	253	69	57	28	...

TABLE 10 (cont'd)

		IMPORTS						EXPORTS					
		1938	1947	1948	1949	1950	1951	1938	1947	1948	1949	1950	1951
FISH, CURED (concluded)													
America, South (concluded)													
Colombia	Q	-	-	-	-	-	...	5	4	-	ø	-	...
	V	-	-	-	-	-	...	1	1	-	ø	-	...
Ecuador	Q	71	78	33	19	18	...	-	-	-	-	-	...
	V	5	11	2	7	2	...	-	-	-	-	-	...
Peru	Q	270	22	1	24	134	...	ø	45	8	7	1	...
	V	48	12	1	5	64	...	ø	8	2	1	ø	...
Surinam	Q	590	667	717	775	595	530	ø	3	1	1	1	ø
	V	...	...	...	...	...	...	...	...	...	...	...	...
Venezuela 5/	Q	150	82	228	*400	*500	...	...	...	...	...	...	...
	V	38	57	156	*300	*400	...	...	...	...	...	...	...
FISH, CANNED: TOTAL	Q	15 817	13 226	9 846	8 491	13 706	...	65	7 381	6 560	7 703	10 004	...
	1/V	3 023	7 325	6 259	4 059	5 791	...	14	3 358	3 307	3 911	4 517	...
America, North													
Mexico 6/	Q	919	687	1 034	233	77	1 239	56	431	757	357	98	174
	V	280	745	922	203	60	1 005	12	183	254	101	20	46
America, Central													
Costa Rica	Q	469	484	368	491	2	...	-	1 457	106	68	64	...
	V	80	229	205	206	2	...	-	517	131	97	88	...
Cuba 2/	Q	3 193	4 267	3 246	3 268	5 672	6 502	-	3	ø	3	5	1
	V	447	2 611	2 042	1 414	2 204	2 506	-	4	ø	2	3	1
Haiti	Q	22	27	23	56	*60	...	-	-	-	-	-	...
	V	6	22	17	38	*40	...	-	-	-	-	-	...
Honduras	Q	...	156	134	198	*200	...	-	-	-	-	-	...
	V	...	84	64	68	*70	...	-	-	-	-	-	...

TABLE 10 (cont'd)

		IMPORTS						EXPORTS					
		1938	1947	1948	1949	1950	1951	1938	1947	1948	1949	1950	1951
FISH, CANNED (concluded)													
America, Central (concluded)													
Nicaragua	Q	...	135	73	69	132	...	-	-	-	-	-	...
	V	...	110	51	44	64	...	-	-	-	-	-	...
Panama	Q	397	300	216	252	471	...	-	-	-	-	-	...
	V	59	174	123	114	185	...	-	-	-	-	-	...
America, South													
Argentina	Q	2 701	1 452	78	3	194	...	...	...	...	2	1	...
	V	699	...	...	...	...	...	...	...	...	...	...	...
Bolivia	Q	912	1 216	940	674	*700	...	-	-	-	-	-	...
	V	9	47	31	18	*25	...	-	-	-	-	-	...
Brazil	Q	1 069	655	328	41	109	...	8	ø	ø	ø	ø	...
	V	351	835	489	68	150	...	2	ø	ø	1	ø	...
Chile	Q	394	45	20	22	22	...	1	120	66	296	365	...
	V	79	86	33	24	24	...	ø	98	49	211	165	...
Colombia	Q	943	2 025	1 120	146	2 292	...	-	-	-	-	-	...
	V	246	1 566	690	80	880	...	-	-	-	-	-	...
Ecuador	Q	359	539	353	810	1 336	...	-	-	-	-	-	...
	V	39	244	199	271	336	...	-	-	-	-	-	...
Peru	Q	1 199	133	32	13	236	...	-	4 618	4 872	6 199	8 721	...
	V	183	124	31	11	151	...	-	2 294	2 631	3 199	3 941	...
Surinam	Q	224	161	149	397	312	528	-	-	-	-	-	...
	V	...	...	...	...	...	...	...	...	...	...	...	...
Venezuela	Q	7/ 3 016	944	1 732	*1 818	*1 891	...	-	752	759	*778	*750	...
	V	7/ 545	948	1 362	*1 500	*1 600	...	-	262	242	*300	*300	...

TABLE 10 (cont'd)

		IMPORTS						EXPORTS					
		1938	1947	1948	1949	1950	1951	1938	1947	1948	1949	1950	1951
CRUSTACEANS AND MOLLUSKS, FRESH OR FROZEN, CURED OR CANNED: TOTAL	Q	1 027	1 349	972	657	940	...	4 399	10 177	15 972	24 489	20 242	...
	1/V	302	951	856	741	942	...	353	5 726	8 896	10 018	9 917	...
America, North													
Mexico	Q	6	97	53	39	83	72	4 164	9 537	15 199	23 693	19 236	21 072
	V	2	108	52	48	82	82	237	4 719	7 962	9 150	8 819	12 033
America, Central													
Costa Rica	Q	4	28	16	1	1	...	-	-	-	-	-	-
	V	15	30	18	1	1	...	-	-	-	-	-	-
Cuba 2/	Q	413	338	447	270	464	685	187	605	710	728	846	678
	V	124	357	377	253	396	502	86	945	890	811	921	695
El Salvador 3/	Q	...	...	...	...	...	...	...	...	...	...	...	...
	V	...	...	...	...	...	...	...	...	...	...	...	...
Honduras	Q	...	8	13	14	*15	...	-	-	-	2	...	...
	V	...	10	15	16	*20	...	-	-	-	ϕ	...	...
Nicaragua	Q	...	...	...	...	5	...	-	-	-	-	ϕ	...
	V	...	...	...	...	7	...	-	-	-	-	ϕ	...
Panama	Q	-	-	-	-	-	...	-	-	-	1	138	...
	V	-	-	-	-	-	...	-	-	-	ϕ	167	...
America, South													
Argentina	Q	514	233	117	9	18	...	...	...	...	ϕ	3	...
	V	118	...	...	...	...	...	...	...	...	...	...	...
Brazil	Q	14	160	26	99	57	...	-	-	-	-	-	...
	V	6	134	20	100	47	...	-	-	-	-	-	...
Chile	Q	...	10	3	5	4	...	48	33	58	57	18	...
	V	...	6	5	7	7	...	30	59	44	56	10	...

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		IMPORTS						EXPORTS					
		1938	1947	1948	1949	1950	1951	1938	1947	1948	1949	1950	1951
CRUSTACEANS AND MOLLUSKS, FRESH OR FROZEN, CURED OR CANNED (concluded)													
America, South (concluded)													
Colombia	Q	37	25	29	4	16	...	-	-	-	-	-	...
	V	24	51	49	10	22	...	-	-	-	-	-	...
Ecuador	Q	1	ø	ø	1	1	...	-	-	-	-	-	...
	V	ø	ø	1	1	1	...	-	-	-	-	-	...
Peru	Q	11	81	51	8	71	...	-	ø	2	8	1	...
	V	2	77	32	5	59	...	-	ø	ø	1	ø	...
Surinam	Q	...	5	1	7	5	5	-	-	3	ø	ø	8
	V	...	...	...	...	...	...	...	...	...	...	...	...
Venezuela	Q	7/ 27	364	216	*200	*200	...	-	2	ø	*ø	*ø	...
	V	7/ 11	178	286	*300	*300	...	-	3	ø	*ø	*ø	...
FISH OILS: TOTAL	Q	2 038	851	618	685	1 021	...	309	1 767	1 887	566	868	...
	1/V	356	502	351	301	322	...	14	437	758	435	115	...
America, North													
Mexico	Q	-	-	-	-	-	-	-	ø	ø	-	ø	-
	V	-	-	-	-	-	-	-	ø	ø	-	ø	-
America, Central													
Costa Rica	Q	16	17	20	25	24	...	-	-	4	-	-	-
	V	5	19	15	19	13	...	-	-	3	-	-	-
Cuba 2/	Q	216	157	125	53	199	118	-	43	57	9	21	-
	V	37	85	81	30	96	56	-	188	125	16	20	-
Dominican Republic	Q	...	...	...	...	28	...	-	-	-	-	-	-
	V	15	37	40	35	31	...	-	-	-	-	-	-
El Salvador	Q	-	30	23	28	34	41	-	-	-	-	-	-
	V	-	22	16	25	22	27	-	-	-	-	-	-

Table 10 (cont'd)

		IMPORTS						EXPORTS					
		1938	1947	1948	1949	1950	1951	1938	1947	1948	1949	1950	1951
FISH OILS (concluded)													
America, Central (concluded)													
Honduras	Q	...	25	32	9	*8	...	-	ø	-	-	-	-
	V	...	19	26	6	*8	...	-	ø	-	-	-	-
Nicaragua	Q	...	...	...	...	21	...	-	-	-	-	-	-
	V	...	...	...	...	17	...	-	-	-	-	-	-
America, South													
Argentina	Q	284	125	120	82	251	...	309	1 626	1 624	489	823	...
	V	60	...	...	...	...	...	14	...	...	...	...	...
Bolivia	Q	39	79	76	189	*200	...	-	-	-	-	-	...
	V	1	3	3	6	*10	...	-	-	-	-	-	...
Brazil	Q	92	87	83	122	-	...	-	ø	-	-	ø	...
	V	28	63	66	76	-	...	-	ø	-	-	2	...
Chile	Q	73	20	12	19	11	...	-	36	159	61	24	...
	V	15	11	7	12	5	...	-	231	626	418	93	...
Colombia	Q	1 287	253	96	106	185	...	ø	-	-	-	-	...
	V	189	203	77	73	95	...	ø	-	-	-	-	...
Peru	Q	31	58	31	52	*60	...	-	62	43	7	-	...
	V	6	40	20	19	*25	...	-	18	4	1	-	...
FISH MEALS AND FERTILIZERS TOTAL	Q	-	-	-	-	-	...	1 868	1 120	1 247	3 278	4 791	...
	V	-	-	-	-	-	...	52	94	96	226	410	...
America, South													
Argentina	Q	-	-	-	-	-	...	1 868	-	-	-	-	...
	V	-	-	-	-	-	...	52	-	-	-	-	...
Chile	Q	-	-	-	-	-	...	...	...	...	20	549	...
	V	-	-	-	-	-	...	.	...	...	2	64	...

Table 10 (cont'd)

		IMPORTS						EXPORTS					
		1938	1947	1948	1949	1950	1951	1938	1947	1948	1949	1950	1951
FISH MEALS AND FERTILIZERS (concluded)													
America, South (concluded)													
Peru	Q	-	-	-	-	-	...	-	474	675	2 708	3 742	...
	V	-	-	-	-	-	...	-	32	42	164	286	...
Venezuela	Q	-	-	-	-	-	..	-	646	572	*550	*500	...
	V	-	-	-	-	-	...	-	62	54	*60	*60	...

1/ 1938, 1947-51, does not include Surinam; 1947-51, does not include Argentina.
2/ 1938: average 1935-39.
3/ 1938, 1947-51 imports: "Fish, fresh or frozen" and "Crustaceans and mollusks, fresh, frozen, cured or canned" included with "Fish, cured".
4/ 1938, 1947-50 imports: "Fish, fresh or frozen" includes "Fish, cured".
5/ 1938 imports and exports: 1937 data; 1937, 1947-50 exports: "Fish, fresh or frozen" includes "Fish, cured".
6/ 1948-51 imports: "Fish, cured" included with "Fish, canned".
7/ 1937 data.

NOTE: This table does not include certain miscellaneous fishery products which are included in tables 8 and 9.

TABLE 11 - LATIN AMERICA: Fish, fresh or frozen, imports to Latin American countries, by countries of origin, 1938 and 1947-51

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Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of origin		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	1 298	931	592	304	350	...
	V	129	10	32	20	46	...
America, North	Q	281	81	50	9	23	27
United States	Q	281	81	50	9	23	27
America, South	Q	59	119	60	94	-	...
Brazil	Q	-	13	-	21	-	...
Peru	Q	1	3	1	5	...	...
Chile	Q	58	103	59	68	...	...
Asia	Q	78	-	-	-	...	...
Japan	Q	78	-	-	-	...	...
Europe	Q	651	646	413	140	168	36
Norway	Q	...	-	15	-	-	13
Portugal	Q	651	646	276	1	2	23
Spain	Q	-	-	122	139	166	...
Unspecified countries	Q	229	85	69	61	57	...

TABLE 12. - LATIN AMERICA: Fish, cured, imports to Latin American countries, by countries of origin, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of origin		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	36 868	36 625	39 103	42 630	48 085	...
	V	4 807	16 628	18 424	20 513	23 145	...
America, North	Q	14 507	12 904	19 724	20 079	12 716	8 059
Canada	Q	12 445	8 954	17 763	18 429	11 075	6 928
United States	Q	2 062	3 950	1 961	1 650	1 641	1 131
America, Central	Q	87	173	153	130	...	...
Bahamas	Q	87	173	153	130	...	...
America, South	Q	...	378	86	87	75	...
Chile	Q	...	378	86	87	75	...
Asia	Q	4	4	7	9	4	12
Hong Kong	Q	4	4	7	9	4	12
Europe	Q	17 811	20 882	17 679	20 606	27 611	6 254
Denmark	Q	-	219	45	-	-	...
France	Q	25	5	15	32	48	129
Iceland	Q	3 175	-	271	146	412	14
Netherlands	Q	523	550	153	22	94	...
Norway	Q	7 781	18 861	14 855	17 185	22 080	5 849
Portugal	Q	129	115	81	-	-	...
Spain	Q	58	28	39	285	170	...
United Kingdom	Q	6 120	1 104	2 220	2 936	4 807	262
Unspecified countries	Q	4 459	2 284	1 454	1 719	7 679	...

TABLE 13. - LATIN AMERICA: Fish, canned, Imports to Latin American countries, by countries of origin, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of origin		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	15 817	13 226	9 846	8 491	13 706	...
	V	3 023	7 825	6 259	4 059	5 791	...
Africa	Q	36	10	-	61	419	174
French Morocco	Q	36	10	-	61	419	174
America, North	Q	6 289	7 416	5 303	4 519	6 860	5 409
Canada	Q	206	554	980	273	734	185
Mexico	Q	1	89	19	13	1	-
United States	Q	6 082	6 773	4 304	4 233	6 125	5 224
America, South	Q	204	610	564	11	203	...
Argentina	Q	138	2	-	-	-	...
Chile	Q	52	2	-	-	...	...
Peru	Q	14	139	23	11	1	...
Venezuela	Q	-	467	541	-	202	...
Asia	Q	1 001	-	-	-	-	...
Japan	Q	1 001	-	-	-	-	...
Europe	Q	5 928	3 682	2 422	749	1 035	1 960
Belgium-Luxembourg	Q	136	-	-	-	-	...
France	Q	133	35	48	45	4	106
Iceland	Q	155	-	-	-	-	...
Norway	Q	230	93	356	81	22	506
Portugal	Q	1 365	3 335	1 867	523	592	668
Spain	Q	3 903	198	140	96	397	680
Sweden	Q	1	21	2	-	14	...
United Kingdom	Q	5	6	9	4	6	...
Unspecified countries	Q	2 359	1 508	1 557	3 151	5 189	...

TABLE 14. - LATIN AMERICA: Crustaceans and mollusks, fresh, frozen, cured or canned, imports to Latin American countries, by countries of origin, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of origin		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	1 027	1 349	972	657	940	...
	V	302	951	856	741	942	...
America, North	Q	241	679	428	126	289	408
Mexico	Q	-	7	21	-	-	...
United States	Q	241	672	407	126	289	408
America, Central	Q	...	20	7	4	9	5
Cuba	Q	...	20	7	4	9	5
Europe	Q	479	349	349	235	283	176
Portugal	Q	63	203	339	125	195	156
Spain	Q	416	146	10	110	88	20
Unspecified countries	Q	307	301	188	292	359	...

TABLE 15. - LATIN AMERICA: Fish oils, imports to Latin American countries, by countries of origin, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of origin		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	2 038	851	618	685	1 021	...
	V	356	502	351	301	322	...
America, North	Q	88	287	141	208	161	28
Canada	Q	-	22	2	1	4	2
United States	Q	88	265	139	207	157	26
Europe	Q	1 817	411	335	337	426	130
Netherlands	Q	866	-	-	-	-	...
Norway	Q	898	402	246	254	413	130
United Kingdom	Q	53	9	89	83	13	...
Unspecified countries	Q	133	153	142	140	434	...

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TABLE 16.- LATIN AMERICA: Fish, fresh or frozen, exports from Latin American countries, by countries of destination, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of destination		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	30 026	70 905	82 927	90 082	122 326	...
	V	3 301	18 892	32 711	31 190	37 268	...
America, North	Q	26 508	70 485	82 546	89 509	121 590	...
Aruba	Q	8	59	30	...	...	...
Curacao	Q	35	130	181	...	...	...
United States	Q	26 465	70 296	82 335	89 509	121 590	68 576
America, Central	Q	1	14	39	35	33	...
Panama	Q	1	14	39	35	33	...
America, South	Q	49	116	58	26	93	...
Argentina	Q	1	8	1	-	-	...
Bolivia	Q	48	108	57	26	93	...
Europe	Q	46	125	215	159	216	...
Italy	Q	28	66	134	82	119	...
Spain	Q	1	48	30	38	52	...
United Kingdom	Q	17	11	51	39	45	...
Unspecified countries	Q	3 422	165	69	353	394	...

TABLE 17.- LATIN AMERICA: Fish, cured, exports from Latin American countries, by countries of destination, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of destination		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	482	1 159	548	407	340	...
	V	83	327	150	112	65	...
America, North	Q	95	120	107	95	30	44
United States	Q	95	120	107	95	30	44
America, Central	Q	72	56	65	77	63	...
Costa Rica	Q	-	37	-	-	-	...
El Salvador	Q	-	11	40	46	...	...
Guatemala	Q	72	1	4	21	54	14
Panama	Q	0	7	21	10	9	...
America, South	Q	223	800	258	129	108	...
Brazil	Q	175	745	257	129	107	...
Uruguay	Q	48	55	1	0	1	...
Europe	Q	2	26	27	15	24	...
Italy	Q	2	26	27	15	24	...
Unspecified countries	Q	90	157	91	91	115	...

TABLE 18.- LATIN AMERICA: Fish, canned, exports from Latin American countries, by countries of destination, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of destination		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	65	7 381	6 560	7 703	10 044	...
	V	14	3 358	3 307	3 911	4 517	...
America, North	Q	56	5 193	5 498	6 105	8 043	...
Canada	Q	-	325	20	-	-	...
United States	Q	56	4 868	5 478	6 105	8 043	164
America, Central	Q	-	80	48	-	ϕ	...
Canal Zone	Q	-	52	48	-	ϕ	...
Guatemala	Q	-	28	-	...	...	...
America, South	Q	1	825	802	60	53	...
Colombia	Q	-	599	756	...	...	...
Ecuador	Q	-	141	1	1	-	...
Peru	Q	1	1	2	4	1	...
Venezuela	Q	...	84	43	59	52	4
Europe	Q	-	740	165	414	890	...
Belgium	Q	-	523	16	65	167	...
Italy	Q	-	-	-	153	200	...
Switzerland	Q	-	217	149	196	523	...
Unspecified countries	Q	8	543	47	1 124	1 018	...

TABLE 19.- LATIN AMERICA: Crustaceans and mollusks, fresh, frozen, cured or canned, exports from Latin American countries, by countries of destination, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of destination		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	4 399	10 177	15 972	24 489	20 242	...
	V	353	5 726	8 896	10 018	9 917	...
America, North	Q	3 648	9 724	15 859	22 881	19 814	21 537
United States	Q	3 648	9 724	15 859	22 881	19 814	21 537
America, Central	Q	3	15	5	1 503	9	52
Cuba	Q	...	-	-	1 500	-	50
Mexico	Q	3	15	5	3	9	2
America, South	Q	44	24	51	11	3	...
Argentina	Q	33	24	8	5	-	...
Peru	Q	11	-	43	6	3	...
Europe	Q	2	231	10	-	2	...
Belgium	Q	2	231	10	-	2	...
Unspecified countries	Q	702	183	47	94	414	...

TABLE 20.- LATIN AMERICAN: Fish oils, exports from Latin American countries, by countries of destination, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of destination		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	309	1 767	1 887	566	868	...
	V	14	437	758	435	115	...
America, North	Q	-	111	149	60	53	...
United States	Q	-	111	149	60	53	...
America, Central	Q	239	-	-	-	-	...
Cuba	Q	239	-	-	-	-	...
Europe	Q	-	1 477	1 523	497	805	...
Belgium	Q	-	657	85	-	-	...
Czechoslovakia	Q	-	250	-	-	-	...
France	Q	-	74	63	47	18	...
Germany	Q	-	-	1 121	450	-	...
Ireland	Q	-	-	251	-	226	...
Italy	Q	-	255	1	-	-	...
Netherlands	Q	-	-	-	-	150	...
Norway	Q	-	ø	-	-	98	...
Sweden	Q	-	ø	-	-	104	...
United Kingdom	Q	9	241	2	-	209	...
Unspecified countries	Q	61	179	215	9	10	...

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TABLE 21.- LATIN AMERICA: Fish meals, exports from Latin American countries, by countries of destination, 1938 and 1947-51

Q - Quantity in metric tons
V - Value in thousand U.S. dollars

Areas and countries of destination		1938	1947	1948	1949	1950	1951
GRAND TOTAL	Q	1 868	1 120	1 247	3 278	4 791	...
	V	52	94	96	226	410	...
America, North	Q	1 607	945	1 226	2 708	3 540	...
United States	Q	1 607	945	1 226	2 708	3 540	...
America, Central	Q	-	175	21	...	...	...
Cuba	Q	-	165	-	...	...	...
Trinidad	Q	-	10	21	...	...	...
Europe	Q	212	-	-	-	-	...
Belgium	Q	101	-	-	-	-	...
Netherlands	Q	111	-	-	-	-	...
Unspecified countries	Q	49	...	...	570	1 251	...

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TABLE 22. - LATIN AMERICA: Estimated investments in the fishery industries of 6 countries

Country	Year	PRIMARY INDUSTRY			SECONDARY INDUSTRY			GRAND TOTAL
		Craft	Gear	Total	Shore facilities	Processing	Total	
		(U.S. dollars)						
TOTAL		20 212 750	13 321 606	33 534 356	...	...	...	...
Argentina	1951	2 291 600	213 706	2 505 306	834 960	...	...	...
Brazil	1950	5 405 000	5 405 000	10 810 000	1/ ...	...	...	...
Chile	1950	1 930 600	1 103 200	3 033 800	586 075	4 102 525	4 688 600	7 722 400
Mexico	1951	3 950 000	1 050 000	5 000 000	1/ ...	11 000 000	11 000 000	16 000 000
Peru	1950/51	4 158 000	3 102 000	7 260 000	1/ ...	7 920 000	...	15 180 000
Venezuela	1949	2 477 550	2 447 700	4 925 250	1/ ...	...	...	...

NOTE: The data in this table are based on figures from official estimates, reports of missions and fisheries specialists, various publications and FAO estimates.

1/ Included with primary industry figures.

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TABLE 23.- LATIN AMERICA: Estimated capital investment in the primary industry of 6 countries. Productivity and investment rates

Countries	Year	Landings in metric tons	Number of fishermen	Production per fisherman in metric tons	Number of boats and other craft		Capital investment in primary industry in U.S. dollars	Capital investment per fisherman in U.S. dollars	Capital investment per metric ton of fish caught in U.S. dollars
					With power	Total			
Argentina	1951	76 870	5 000	15.4	376	626	2 505 000	501	33
Brazil	1950	160 000	150 000	1.1	1 200	74 600	10 810 000	72	68
Chile	1950	93 000	7 500	12.4	910	4 223	3 033 800	404	32
Mexico	1951	70 000	12 000	5.8	1 700	6 000	5 000 000	417	71
Peru	1950/51	105.550	8 000	13.2	600	3 000	7 260 000	907	69
Venezuela	1949	75 000	22 300	3.4	...	5 800	4 930 000	221	66

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