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DEVELOPMENT OF THE MEXICAN TUNA INDUSTRY 1976-86

by
Linda Lucas Hudgins

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TUNA INDUSTRY 1976-86**

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1986

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FOREWORD

At its inaugural meeting in Pago Pago in 1981, the Pacific Islands Development Program was directed by the Standing Committee of the Pacific Islands Conference to evaluate the potential beneficial role of multinational corporations in the Pacific islands region. In 1984 the Standing Committee again addressed the question of multinational corporations and approved that this study be undertaken on a sectoral basis, with the tuna industry being the first sector to be examined.

The tuna industry was selected as the first sector for investigation because the tuna fishery and industry in the Pacific islands region affect all countries and territories. The broad objectives of the tuna sectoral study are (1) to analyze the current and future role of multinational corporations in the tuna industry in the Pacific islands region, and (2) to evaluate the potential contribution these corporations could make to industry development in the region. This project is the first comprehensive study of the tuna industry in the Pacific islands region and focuses on those regional and international issues that affect the industry from the perspective of all island countries.

In 1984 a proposal outlining the tuna sectoral study was drawn up in consultation with the Forum Fisheries Agency. This research project, which commenced in January 1985, is publishing a range of technical reports that address issues critical to the development, management, and expansion of tuna industries in the Pacific islands region.

This report, prepared by Dr. Linda Lucas Hudgins, traces the development of the tuna industry in Mexico from 1976-86. The industry in Mexico is important for Pacific island countries for several reasons. First, Mexico has the newest and largest purse seine tuna fleet in the world. Second, Mexico has the largest catches in the eastern tropical Pacific Ocean. Third, decisions made by the industry in Mexico could affect investment and marketing opportunities for industries in the Pacific islands. For example, because some Mexican seiners operated in the Western Pacific in 1984-85, the possible establishment of joint ventures between Mexican seiner operators and Pacific island governments

has been discussed. Fourth, the development of the industry in Mexico presents a model for fisheries development that could provide policy guidance for island countries in developing and managing their own domestic industries.

Two other similar country studies deal with the development and current status of the tuna industries in the Philippines and Thailand.

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ABBREVIATIONS AND ACRONYMS

ATSA	American Tuna Sales Association
BANPESCA	Banco Nacional Pesquero y Portuario, S.N.C., Institución de Banca de Desarrollo (National Fishery and Ports Development Bank)
CYRA	Commission's (IATTC) Yellowfin Regulatory Area
EEC	Exclusive economic zone
FAO	Food and Agriculture Organization (United Nations)
GRT	Gross registered tonnes
IATTC	Inter-American Tropical Tuna Commission
OLDEPESCA	Organización Latinoamericana de Desarrollo Pesquero (Latin American Organization for Fishery Development)
PEMEX	Petroleos Mexicanos (Mexican National Petroleum Company)
PICOSA	Pesca Industrial Corporación, S.A. (Industrial Fish Corporation)
PPM	Productos Pesqueros Mexicanos (Mexican Fishery Products)
SAM	Sistema Alimentos Mexicanos (Mexican Nutrition System)
SEPESCA	Subsecretario de Pesca (Subsecretariat of Fisheries)



ABSTRACT

The Mexican government legislated a 200-mile exclusive economic zone (EEZ) in 1976 and targeted the tuna industry for development in the national fisheries development plan. The government offered tax and financing incentives to private sector investors. These investors developed a purse seine fleet that is now the newest and largest in the world. The Mexican fleet has the largest catches of any country fishing in the eastern tropical Pacific Ocean.

The Mexican tuna development plan was tightly linked with the national goals of export promotion, employment generation, and general economic growth. The Mexican government consistently renewed its commitment to development of the tuna industry. At its current stage of industry development several goals have been realized. Some new employment has been generated, the fleet and canning sectors have moved closer to full capacity utilization, and Mexico may soon be looking at other areas of the Pacific for fishing.

The harvesting sector of the industry appears to be relatively efficient based on Inter-American Tropical Tuna Commission (IATTC) ratings. However, there are continuing bottlenecks in the canning and food distribution sectors as well as a need for more trained workers and specialized equipment in the port sector. Although the domestic market offers a potential for the future, this potential will be realized only if the relative prices of tuna are competitive with other protein sources. The Subsecretariat of Fisheries in Mexico ([SEPESCA] Subsecretario de Pesca) currently evaluates these development issues.

The tuna industry development has not been without financial problems. Specifically, the U.S. tuna embargo (1980-86) closed the major market to the Mexican industry and forced unexpected hardship on the industry in the early phases of its development process. In addition, the financial crisis in Mexico since 1982 severely affected the industry. Without foreign exchange earnings the vessel owners were hard pressed to pay their dollar denominated fixed debt with foreign shipyards. The National Fishery and Ports Development Bank ([BANPESCA] Banco Nacional

Pesquero y Portuario, S.N.C.) undertook a refinancing program for the vessels in 1984. The refinancing and resolution of the embargo solved the cash flow problem for the short run only. For the long term, new domestic and international markets will have to be developed.

INTRODUCTION

As of July 1986 Mexico has the largest tuna fleet fishing in the eastern tropical Pacific Ocean. The Mexican purse seine fleet will have the potential by 1987 of becoming the largest in the world, surpassing in capacity the fleet of the United States. The Mexican fleet by the end of 1986 could have the largest catches in the eastern Pacific of the eleven countries reporting to the Inter-American Tropical Tuna Commission (IATTC). These countries, ordered by size of catch in 1985, are United States (89,900 tonnes), Mexico (78,083 tonnes), Ecuador (32,451 tonnes), Venezuela (27,088 tonnes), Costa Rica (3,363 tonnes), and Colombia, Panama, Peru, Cayman Islands, USSR, Spain, Vanuatu (131,259 tonnes combined) (Joseph 1986).¹

This paper describes the development of the tuna industry in Mexico from 1976 to 1986. Attention focuses on the historical development of the industry and those economic and political factors that influenced this development. The paper also examines the Mexican experience as a model for other developing fisheries.

Mexico and the countries of the South Pacific share common conditions with respect to tuna industry development. These conditions are (1) the availability of abundant tuna resources, and (2) a commitment to exploit these resources as a source of employment, foreign exchange, food protein, and economic development revenue. The strong commitment of the Mexican government to develop its tuna resources played a crucial role in the survival of the country's industry.

Some caveats can be made regarding the applicability of the Mexican model of tuna development to the economies of the Pacific islands. The Mexican economy is massive in relation to those in the Pacific islands. Mexico's real gross domestic product in 1983 was US\$97.3 billion.² Therefore, because of size and relative degree of economic development, Mexico has access to those domestic and international credit markets foreclosed to smaller economies. In addition, Mexico's population of over 81 million offers the

potential for a large domestic market not available to smaller economies.

The first sections of the paper give an overview of the role of government policy in the development of the Mexican tuna industry followed by an overview of industry conditions and an examination of domestic and international markets. Both the imposition of the U.S. embargo against Mexican tuna imports (1980-86) and the financial crisis in Mexico (1982) severely affected the country's developing tuna industry. The effect of these events, as well as internal industry problems, is described and analyzed in the last sections of the paper.

GOVERNMENT POLICY

Legislative and administrative background

Mexico legislated the 200-mile exclusive economic zone (EEZ) in June 1976. Fisheries development was a priority of the Lopez-Portillo administration (1978-82), and the administration of de la Madrid (1982-) reconfirmed this commitment. The National Fisheries Plan (1977) directed the Subsecretario de Pesca ([SEPESCA] Subsecretariat of Fisheries) "to formulate and coordinate fishing policy, to develop a fishing fleet and ports, and to promote the industrialization and consumption of fish." The goals for the fishery sector were defined (within a framework of resource conservation) in the fisheries plan as (1) increased catch and domestic production of fish and fishery products, (2) increased employment in the fishery sector, (3) diversification of catch through establishment of new fleets, and (4) development of new domestic and international markets.

Fishery development was included as a part of Sistema Alimentos Mexicanos ([SAM] Mexican Nutrition System) a program to enhance Mexico's self-sufficiency in the production of basic foodstuffs.³ SEPESCA, formerly the Department of Fisheries, vigorously pursued foreign marketing opportunities for fishery products and undertook biological analyses of stocks. Studies were also undertaken to assess the potential domestic consumption levels of fish and fish products. The fishery development program was integrated with the national macroeconomic goals of employment generation, economic growth, export promotion, and import substitution for human food and animal feed.

Two government agencies are involved in the direct implementation of fisheries policy in Mexico: SEPESCA and BANPESCA. National industrial policy is developed by SEPESCA with BANPESCA providing funds to the projects identified by SEPESCA. The National Fishery and Ports Development Bank ([BANPESCA] Banco Nacional Pesquero y Portuario, S.N.C.) was specifically established in 1979 to provide credit to the country's

fishing industry and to facilitate the financing of new fleets and processing plants.

Both SEPESCA and BANPESCA are headquartered in Mexico City with branches at all major ports. BANPESCA assumed a more important policy role with the onset of the Mexican financial crisis in 1982. This crisis directly affected the ability of the tuna fleet to repay the external debt guaranteed by BANPESCA, and BANPESCA became more involved in policy. The financial crisis and the respective role of BANPESCA are discussed below in the industry overview.

Other legislation relevant to fisheries concerns the ownership of Mexican business and nationality of crew. Foreign ownership of business in Mexico cannot exceed 49 percent, although recently this restriction has been ignored in an attempt to attract foreign investment into the Mexican economy. In addition, the registered captain of a fishing vessel must be a Mexican citizen. There are no legal provisions that permit foreign crew members, although each vessel may employ up to five foreign instructors for periods of up to two years.

Private sector incentives

Mexico's largest fisheries were in shrimp and anchovy at the time of the introduction of the National Fisheries Plan. The shrimp industry was primarily located on the Atlantic Ocean coastline and targeted for export to the U.S. market.⁴ The anchovy industry was located on the west coast in Ensenada, Baja California and was targeted for production of domestic animal feed.

The tuna industry was initially located at Ensenada, Baja California, which had a small tuna fishery in the early 1970s. Within Mexico, the Baja California peninsula enjoys free trade zone status. Tuna producers could therefore import vessels, parts, and other productive inputs without the imposition of import tariffs. Exports were likewise tariff free. This free trade zone status existed before the goals of tuna fishery development were defined. This free trade zone status has helped the Mexican tuna industry to avoid the export and import tariffs levied by the government on other Mexican industries.

The Mexican government was instrumental in encouraging private investors, many of whom had formerly owned shrimp vessels, to move into the tuna industry when shrimp vessels were

nationalized and sold to cooperatives in 1979. The major incentives for these private investors were a potentially lucrative U.S. tuna market for exports and the abundant tuna resources in the eastern tropical Pacific Ocean. The long term objectives of tuna fleet development were the exploitation of tuna resources in the eastern Pacific Ocean with a fleet of 115 superseiners (over 1,000 gross registered tons [GRT]) and the sale of round and processed (canned) tuna in international markets, particularly in the United States.

Private sector investors put up 15 percent (US\$60 million) of the tuna vessel purchase price and between 1978 and 1982 purchased 54 new purse seine vessels for \$400 million to be built abroad. BANPESCA financed 31 of these vessels—about 40 percent of the total fleet debt—and further guaranteed the debt on the remaining 23 vessels (about 60 percent of the fleet debt). Of the 54 new vessels fourteen were less than 900 GRT in size while the rest were 1,000 GRT or larger. Initially, the government gave income tax concessions to those willing to invest in the tuna industry by taxing industry profits at a rate of seven percent. By 1986 these concessions were removed. Industry profits are currently taxed at regular industry rates (about 42 percent).

Government operations in the tuna industry

Direct participation by the government in the development of Mexico's tuna industry includes direct purchase of vessels, construction of vessels, and state-run canneries. In 1986 the government owned 25 vessels outright, representing a total operating capacity of about 10,745 GRT. Five of these vessels were small baitboats. The government has plans to build five 75 GRT baitboats (DELFIN series) and fourteen 750 GRT purse seine vessels (ATUN series) representing an operating capacity of about 6,000 GRT. Construction plans for ten of the Delfin and two of the Atun series along with two 1,200 GRT vessels were, however, uncertain in 1986 because of the domestic financial crisis.⁵

Nine state-run canneries are operated by Productos Pesqueros Mexicanos ([PPM] Mexican Fishery Products) and located predominantly on the Baja California peninsula. These general food canning plants represent about 55 percent of the total installed canning capacity in 1986. Production and operation of these

canneries are discussed more fully below in the section on ports and processing capacity.

Government political activity

The development of the tuna industry in Mexico was affected directly by government initiatives other than those associated with SEPESCA and BANPESCA. In particular, the declaration of the Mexican EEZ indirectly led to Mexico's withdrawal from the IATTC and the subsequent imposition of the U.S. embargo on all tuna and tuna products from Mexico.

The IATTC is an international organization established in 1949 to undertake tuna biological and conservation research in the eastern tropical Pacific Ocean. Its founding members were the United States and Costa Rica. Mexico joined in 1964. Member countries of the IATTC, coastal as well as non-coastal, agree to self-regulate tuna fishing activity in the region with the goal of conservation of tuna resources. In 1969 the IATTC established seasonal catch quotas for yellowfin tuna based on biological stock assessment studies. In 1978 Mexico withdrew from the organization in conflict over quota allocations, which it believed favored countries with large historical catches—particularly the United States—over those members that were developing new fleets.

The U.S. position on tuna maintains that coastal countries cannot claim jurisdiction over migratory marine species. Mexico, along with many other coastal countries, challenges this position. In January 1980 President Lopez-Portillo issued a decree requiring that a license fee be paid for tuna fishing in the Mexican EEZ. In July 1980 the Mexican navy arrested U.S. tuna seiners for fishing in the Mexican EEZ without permits. The United States imposed an embargo against importation of all Mexican tuna and tuna products. Negotiations between the United States and Mexico over access rights for the U.S. tuna fleet to the Mexican EEZ had been unsuccessful for three years prior to imposition of the embargo. Mexico terminated all fishing treaties with the United States in December 1980.

In Mexico City the "tuna war" with the United States was seen as an issue of national integrity. Enforcement of the embargo by the United States was primarily motivated by domestic protectionism. In April 1986 Mexico proposed voluntary annual export restraints of 20,000 tonnes to the U.S. tuna market. Govern-

ment sources in both countries believe that this proposal provided the impetus for resolution of the embargo in August 1986. There is a long history of U.S. enforcement of its tuna policy and imposition of import embargos. Some Mexican industry sources, however, still insist that they were betrayed by the Mexican government's position that allowed the embargo to continue for so long and thereby foreclosed the country's major market.

Impact of the 1982 financial crisis

The debt for the 54 new tuna vessels was, except for one case of Spanish pesetas, denominated in U.S. dollars. Delivery dates were scheduled for the early 1980s. These vessels were built in various shipyards in Europe and the United States. In the time interval between vessel orders and vessel delivery, the Mexican peso was allowed to float relative to other world currencies. By 1982 a combination of falling oil prices and revenues, the currency devaluation, and a large external debt exceeding US\$80 billion drove the Mexican economy into a fiscal crisis and severe recession. The tuna industry began to feel the crisis immediately. Several vessels were out of service during 1982-83 in part because dollars were not available to purchase replacement parts or make repairs. The debt burden in pesos on the new vessels increased by over 700 percent between 1980 and 1984. During the same period the world price of tuna declined by over 30 percent.

In late 1983 BANPESCA proposed to the vessel owners a vessel refinancing scheme that was formally implemented in May 1984. The plan involved BANPESCA assuming the external debt with foreign shipyards and, in turn, refinancing the vessels with the Mexican owners at an average of 175.5 pesos to the dollar. The exchange rate at the time of the vessel purchases (1980) was 22-25 pesos to the dollar. A requirement of the refinancing plan was that vessels would have to meet production goals to qualify for continuing participation in the program. Debt amortization was extended in some cases. Once the refinancing plan was operational all funds were channeled through BANPESCA, including proceeds from tuna sales to the government run canneries.

According to the refinancing plan, BANPESCA would return operating monies to the vessel owners after debt payments were made. Industry sources say that operational monies have been delayed and that this has generated a cash flow problem, which

severely affects fleet productivity. A recent government evaluation of the success of the refinancing through April 1986 gives mixed results. Few vessels were able to meet production goals and thus have not made regular debt payments.

Private industry vessel owners attribute their inability to pay off the debt to several factors: (1) dollars are returned to the fleet at the controlled dollar rate rather than at the free exchange rate, (2) the government price paid at state canneries has been consistently under world prices, and (3) the decline in world tuna prices. Vessel owners also cite inefficiencies in the canning and distribution sectors of the industry, which reduce sales. (These alleged inefficiencies are discussed below in the section on port and processing capacity.) BANPESCA officials argue that vessel costs are less than those reported by industry and therefore that vessel operations are sufficiently profitable to make debt payments. Repayment of the vessel debt is a continuing source of friction between government and industry.

Three direct effects on the Mexican tuna industry related to the country's financial crisis can be considered outside the controversy of vessel debt payment: (1) devaluation of the currency (1981) would have made Mexican exports relatively cheaper, but the U.S. embargo prevented the Mexican tuna industry from taking advantage of their currency position; (2) the inability on a national level to acquire hard currency for debt service and operating expenses had negative impacts on industry development and efficiency; and (3) the general economic recession in Mexico reduced incomes and national consumption of all goods thus reducing the domestic demand for canned tuna.

Summary

The legislation and administration of the Mexican tuna industry development followed a predictable pattern. Incentives offered to private investors were economically sound and seem to have been successful in attracting the necessary investment capital. Therefore, one crucial issue in this industry development is that the private sector had cash reserves (from the sale of shrimp vessels) available for reinvestment.

Mexico has active state participation in the fleet, but that participation is a relatively small percentage (22 percent) of the total.⁶ Although government owned canneries have 55 percent of

the installed processing capacity, Mexico did not increase its financial and risk exposure with respect to the tuna industry by building additional plants. The Mexican government has an almost nonexistent role in sales, distribution, and marketing, which are predominantly handled by large food conglomerates.

Some analysts have argued that the Mexican government could have foreseen the imposition of the U.S. tuna embargo. It is still unclear who are the biggest losers or winners as a result of the six-year embargo. The Mexican industry was dealt a serious, though not fatal blow, through the loss of its principal export market. The U.S. tuna industry, which pushed for the enforcement of the U.S. tuna policy, was deprived of access to its most abundant and closest resource. The embargo contributed to the deployment of the U.S. fleet in the central and western Pacific and the eventual closure of all but one tuna cannery on the U.S. mainland and in Hawaii. The embargo cost Mexico an estimated US\$200 million in lost export value for the period 1980-85.⁷

The embargo is one result of industry development where world markets are characterized by protectionism. The current financial crisis of the fleet also can be partly attributed to the currency devaluation and the inefficiencies in processing, sales, and product distribution.

INDUSTRY OVERVIEW

Resource availability

Almost 100 percent of Mexican tuna fleet operations occur within the Mexican 200-mile EEZ although some vessels have begun to fish farther south along the central and south American coast. The fleet is expected to continue to follow this pattern in the immediate future as long as the tuna resources remain plentiful in the eastern tropical Pacific. According to industry sources, all the yellowfin tuna that they need can be caught within 150 miles of the Mexican coastline. Mexican vessels also have fished in the western Pacific, and industry sources say they would consider fishing in that area in the future.⁸

The fishery for all tuna in the eastern tropical Pacific includes the Mexican EEZ and extends westward to 150° W longitude. The regulated area of the IATTC covers approximately 30 percent of the total fishery area. The Mexican fleet fishes in its EEZ while another 150 vessels from various countries fish just outside the EEZ within about 400 miles of the coastline. Before 1981 about 30 percent of the total harvest by the entire eastern Pacific tuna fleet was made in the Mexican EEZ.

The IATTC reports that the sustainable yield of all tuna from its Commission's Yellowfin Regulatory Area (CYRA) is 545,400 tonnes per year. The estimates for yellowfin are 181,800 tonnes, skipjack 172,710 tonnes (minimum), and other tuna 72,720 tonnes (minimum). The IATTC estimates that 183,750 tonnes of yellowfin, skipjack, and bluefin will be caught in the CYRA in 1986.⁹

Although Mexico is not a member of the IATTC, cooperation is continuing between Mexican fishery officials and the IATTC. At the 1985 Commission meeting, representatives came from France, Japan, Nicaragua, Panama, and the United States. Observers came from Chile, Costa Rica, Ecuador, Mexico, New Zealand, Peru, the Republic of Korea, the International Whaling Commission, the South Pacific Commission, and U.N. Food and Agricultural Organization (FAO). At this meeting the total yel-

lowfin tuna catch quotas of 159,075 tonnes were adopted for the year 1986. Resolutions were also adopted that gave the IATTC's scientific administrator the leeway to increase this quota by two increments of 13,635 tonnes each.

The Mexican estimates of annual yield of all tuna in its own EEZ is 170,000 tonnes per year. Seventy-five percent of the yellowfin and skipjack (129,000 tonnes) is concentrated in the northern area of the zone off the Baja California peninsula and the central southern region off the tip of the Baja peninsula. The remaining 25 percent of yellowfin and skipjack is located on the Atlantic coast in the area of the Yucatan peninsula in the Gulf of Mexico (Figure 1).

By the end of 1987 the Mexican tuna fleet will have an annual catching capacity of nearly 140,000 tonnes. This amount is about 30,000 tonnes less than the estimated resources in the Mexican EEZ. The Mexican government recently announced that it will issue more permits in the future to foreign vessels to fish the EEZ (*Fishing News International*, 1986:56). Thus the resource availability to the Mexican fleet will increasingly depend on the potential competition from foreign vessels.

Fleet capacity and production

Mexico's original tuna development plan in 1977 called for a total fleet of 120 vessels. This number was later revised downward to 115 and subsequently to 104 vessels. The Mexican fleet is now expected to be rationalized at 89 vessels. The following discussion is based on the current fleet projection of 104 operational vessels by the end of 1987.

Specifications of the projected Mexican tuna fleet are given in Table 1 by year of construction and vessel size. Of the vessels 31 are less than 400 GRT in size, 27 between 401 and 750 GRT, and 46 between 751 and 1,200 GRT. Since 1980, 75 vessels have been built, which makes the Mexican fleet the newest in the world. As of July 1986, 16 of the 104 vessels were still under construction while 39 were inactive awaiting re-outfitting, repairs, or parts. Six vessels had sunk. Of the total projected tuna fleet of 104, 70 percent will be purse seiners and 30 percent will be baitboats. In 1985 there were 61 vessels, representing 18,900 tonnes of carrying capacity, actively fishing in the Mexican fleet. As of July 1986, 59 vessels were fishing.

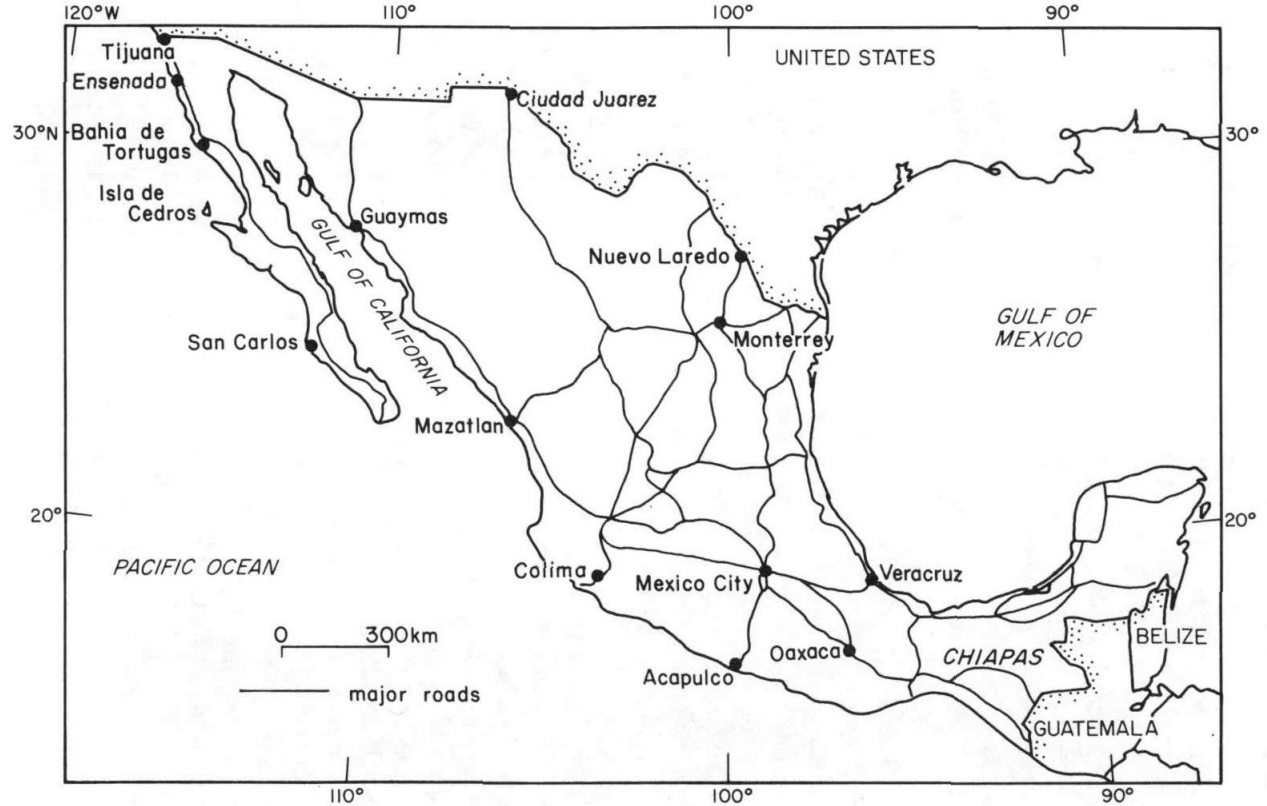


Figure 1: Major Mexican ports and fisheries processing areas.

Table 1. Mexican tuna fleet by year built and vessel size, 1970-87

Year built	Vessel class			Annual total (all classes)
	I (400 GRT)	II (401-750 GRT)	III (751-1,200 GRT)	
1970-75	9	10	3	22
1976-79	—	5	2	7
1980	2	2	3	7
1981	4	1	9	14
1982	3	1	11	15
1983	3	2	14	19
1984	—	—	—	—
1985	—	2	1	3
1986	7	4	1	12
1987	3	—	2	5
Total planned fleet	31	27	46	104
Total active fleet July 1986	14	10	35	59
Under construction ^a	10	4	2	16
Tied up ^b	5	5	8	18
Refitting	—	4	1	5
Total inactive fleet July 1986	15	13	11	39
Sunk	2	4	—	6
Total planned fleet	31	27	46	104

^aFifteen of these vessels may be cancelled before or during construction.

^bThese vessels are built but not yet operating because of repairs (2 vessels), awaiting leasors (10), difficulty obtaining outfitting (3), or financing (2). One vessel was not received in Mexico until September 1985 from the shipyard.

Source: Mexican tuna industry personal communications. June 1986. Mexico City.

Catches by the Mexican tuna fleet and fleet capacity from 1976 to 1986 are shown in Table 2. Historically, the Mexican catch has on average been composed of about 70 percent yellowfin tuna and about 30 percent skipjack tuna. This proportion varies by year depending on yellowfin availability. For example, in 1986—a good fishing year—the catch has been composed of about 90 percent yellowfin, and it appears that the fleet may catch over 110,000 tonnes. The years 1982 and 1983 essentially represented lost years to the fleet because of the dollar crisis, the effects of El Nino on resource availability, and the closure of the U.S. market.

Fleet ownership and efficiency

The Mexican tuna fleet is broken down by ownership and vessel type in Table 3. The predominant form of vessel ownership is private (60 percent). The private sector also has the highest catch

Table 2. Mexican tuna fleet, number of vessels, total capacity, and total catch 1976–86

Year	Fleet capacity in use (GRT)	Vessels in operation	Total vessels ^a	Total catch ^b (tonnes)
1976	13,860	25	25	—
1977	13,798	24	26	19,546
1978	13,437	23	28	25,429
1979	14,622	25	31	31,983
1980	36,162	46	41	33,116
1981	41,335	56	57	70,507
1982	33,300	51	52	41,484
1983	33,609	44	55	27,761
1984	45,380	55	72	72,800
1985	46,900	61	77	94,100
1986	68,500	59	98	100,770 ^c

^aThese figures reflect the year in which vessels were operational regardless of year in which they were built. The 1978–81 numbers are the best available without detailed information on sinkings.

^bThere is an unexplained 3,000 tonnes undercounting in the government reported catches for some years. This column reflects industry supplied data.

^cCatch through December 1, 1986.

Source: IATTC Weekly Reports; Mexican tuna industry unpublished data.

Table 3. Ownership pattern of Mexican tuna fleet by type of vessel, capacity, catch, and IATTC efficiency rating, 1985

Ownership	Purse seiners							Baitboats					
	Number of vessels	%	Capacity of vessels (GRT)	%	1985 catch (tonnes)	%	IATTC ^a efficiency rating	Number of vessels	%	Capacity of vessels (GRT)	%	1985 catch (tonnes)	%
Private	35	60	34,110	78	77,844	83	2.28	3	23	345	32	592	55
Cooperative	9	16	3,950	9	8,802	9	2.23	5 ^b	38	370	34	370	34
State	14	24	5,685	13	7,437	8	1.31	5	38	375	34	115	11
Total	58 ^c	100	43,745	100	94,083	100	—	13	99	1,090	100	1,077	100

^aThis rating represents catch per short ton of carrying capacity weighted by vessel size. This rating for the Mexican fleet is based on an IATTC calculation.

^bOnly two of these were active in the fleet during 1985.

^cThree vessels were non-operational at the end of 1985 because of repairs. These three plus the 58 active vessels brings the total 61 to agree with data in Tables 1 and 2.

Source: Mexican tuna industry personal communications. June 1986. Mexico City.

and potential profitability ratio. The private sector vessels sell their catch on the international market if domestic canneries cannot accept it due to capacity constraints. The cooperative and state sectors primarily supply domestic market needs through sales to the government owned and operated canneries. This pattern of ownership and sales should continue after all the vessels under construction are in service.

The IATTC efficiency rating by type of ownership is also given in Table 3. The IATTC ratings by type of ownership represent a standardized measure of catch per short ton of vessel capacity. These ratings should be considered as suggestive of potential efficiency, given the degree of development of this fleet and the fluctuations in capacity utilization. The IATTC rating does not consider production costs per short ton caught or capacity utilization levels, which better reflect economic efficiency and long-run profitability.

Catch by vessel size for the Mexican fleet is given in Table 4. Class III vessels (751-1,200 GRT) have catches that exceed the average for the entire eastern Pacific fleet, which includes vessels from 12 countries.

Estimated costs per tonne of tuna produced are given in Table 5 for a representative Mexican 1,200 GRT purse seine vessel. Crew costs for the Mexican vessel are less than those of a proforma 1,200 GRT vessel operating at full capacity. Fuel consumption and insurance costs are greater than expected for a typical vessel of this size. Actual short run production costs for a 750

Table 4. Mexican tuna fleet catch by vessel size, 1985

Vessel size	Number of active vessels	1985 catch (tonnes)	IATTC efficiency rating ^a
Class I (<400 GRT)	14	2,763	1.59
Class II (401-750 GRT)	10	18,154	1.76
Class III (751-1,200 GRT)	35	73,166	2.31
Total ^b	59		

^aMexican vessels.

^bExclusive of sunk vessels.

Sources: Mexican tuna industry personal communications. June 1986. Mexico City; data from Table 1.

Table 5. Estimated costs of operation for representative 1,200 GRT Mexican tuna vessel, 1985

Input	Percentage of total costs ^a
Fuel and oil	21-22
Crew wages	24-26
Crew provisions	2-3
Unloading/dock expenses	1-2
Repairs	8-15
Insurance	9-10
Helicopter expenses	8-13
Administration	3-5
Salt	1
Other	3-20

^aPercentages are based on total costs per trip made exclusive of debt service and depreciation.

Source: BANPESCA and Mexican tuna industry unpublished data and personal communications. June 1986. Mexico City.

GRT vessel in the Mexican fleet are about US\$469 per tonne caught, while costs for a 1,200 GRT vessel in the Mexican fleet are approximately \$670 per tonne caught.¹⁰ These figures do not include an account for debt service or depreciation. Production costs per tonne as compared with world tuna prices provide a measure of the economic efficiency of the Mexican fleet. At \$750 a short ton, the Mexican vessels are competitive exclusive of debt service. Based on the IATTC ratings, the fleet is efficient in catching tuna. Accurate data for the fully operational fleet are not yet available to assess the economic efficiency or the long run viability of the fleet.

Ports and processing capacity

Mexican port capacity for unloading, refrigeration, and processing tuna are given in Table 6. There appears to be slightly less unloading capacity than that needed to utilize total catches of the projected fleet of 104 vessels. Potential unloading capacity is about 528 tonnes per 8-hour shift or 126,700 tonnes annually.¹¹ Several ports have inadequate handling equipment, skilled labor, and other complements for efficient unloading. These problems have been identified by the Mexican government, and plans are underway to alleviate them.

Table 6. Capacity for unloading, refrigeration, and processing tuna at Mexican ports, 1985

	Tonnes	Annual tonnes
Unloading capacity per 8-hour shift	528	126,720
Refrigeration hold capacity	24,845 ^a	149,070 ^b
Canning capacity per 8-hour shift	552	132,480 ^c

^aCapacity will be 28,900 tonnes after the installations at Chiapas and Colima become operational.

^bBased on six rotations of product through refrigeration per year. Average length of time in refrigeration is two months.

^cBased on 240 shifts per year of 8 hours each.

Sources: Tables 3, 4, 5, 39 of unpublished data in Republic of Mexico, BANPESCA internal report on tuna industry (1985), personal communication with cannery managers. September 1985. Ensenada, B.C., Mexico.

Tuna is unloaded at eight ports on the Pacific coast (Figure 1): in Baja California north (Ensenada, San Carlos, Isla de Cedros), in Baja California south (LaPaz, Bahia de Tortugas), in Sinaloa (Mazatlan, Topolobampo), and in Oaxaca (Salina Cruz). Only Ensenada and Mazatlan have enough skilled labor and suitable handling equipment to be fully operational. As a result, these two ports are subject to overcrowding. The handling capacity at other ports could be almost doubled with an increase in equipment and labor inputs.

The total refrigeration capacity (149,000 tonnes annually) appears to be adequate. The cost of refrigeration in Ensenada is about US\$15 per tonne per month. The refrigeration capacity is 30 percent owned by the public sector and 70 percent by private and public sector canners. Port congestion increases the cost of processed tuna in Mexico because catches have to be held in refrigeration while waiting for processing capacity to free up.

Currently 18 canneries are packing tuna in Mexico. These general food product canneries also process fruit, vegetables, and other fishery products. This non-specialized processing sector has been identified as a bottleneck and a source of inefficiency. These general product plants operating at full capacity could can approximately 132,500 tonnes of tuna per year. If the fleet operated at full capacity and if markets were available, additional seafood canning capacity would be required to accommodate landings.

An alternative would be to operate the existing canneries on a 24-hour basis at the expense of canning other food products.

Processing plants are located in three areas (Figure 1): Ensenada in the north of the Baja California peninsula, with about 56 percent of the total tuna canning capacity in Mexico; the southern part of the Baja California peninsula with about 24 percent of the total canning capacity, and the state of Sinaloa with about 18 percent of capacity. Smaller canneries are located in and near Veracruz on the Atlantic coast.

On average, the Mexican canneries produce about 0.48 tonnes of canned tuna for each 1.0 tonne of input. The estimated costs of canning with existing canneries are given in Table 7. These costs represent average costs across a variety of different size and quality plants. The estimated cost of US\$23.30 per case is within the range of wholesale list prices for comparable cases produced by various countries. Production costs per standard case reported in

Table 7. Estimated costs of canning tuna in Mexico by type of input, 1985

Input	Cost per case ^a	
	Estimated cost (pesos)	Percent of total
Raw tuna	6,472	64
Vegetable oil	686	7
Seasonings	96	1
Cans	1,178	12
Labels and cartons	170	2
Labor	613	6
Machinery	824	8
Total input costs	10,039	78
Administration	284	2
Freight/commissions	766	7
Finance costs	441	4
Plant costs	1,281	9
Total administration	2,772	22
Cost per case	12,811 ^b	

^aStandard case consisting of 48 cans of 198 grams each.

^b550 pesos/US\$1 exchange rate; thus 12,811 pesos = \$23.30.

Source: Republic of Mexico BANPESCA internal report on Mexican tuna industry (1985).

Infopesca (1986) by country are Ecuador (\$24.00), Fiji (\$31.30), Japan (\$24.40), Taiwan (\$23.75), Thailand (\$20.00), and Venezuela (\$31.00). While the wholesale price in Mexico may be competitive with other international canners, the domestic retail price of a can of tuna in Mexico (203 pesos [US\$0.30] in July 1986) is expensive relative to incomes and other protein sources.

The government run canneries market their product under the trade names Conasupo, Consecha Del Mar, Ocean Garden, and Pescador. The product is sold domestically and targeted for low-income consumers. These brand names account for about 35 percent of the domestic market according to 1982 estimates.¹²

Alleged inefficiency in the state canning operations is attributed to poor management, lack of specialization in fishery products, and relatively high administrative costs. To avoid these sources of inefficiency, two new seafood plants are under construction. These plants will process only seafood and have a larger-scale operation (18,000 tonnes each) than the current multi-product plants. The plants are being designed in cooperation with investors and government agencies in France. French canning technology will be used, and the plants will be in operation by the end of 1987. The plants will be managed as quasi-public Mexican corporations under the name Pesca Industrial Corporación, S.A. ([PICOSA] Industrial Fish Corporation) and will be located in the states of Colima (Manzanillo) and Chiapas (Puerto Madero). Mexican industry sources report that in return for financing and technological advice, the French investors will receive 3 percent equity from the plant operations.

Tuna industry employment

One of the goals of the National Fishery Plan was to generate domestic employment. On average, purse seiners have between 16 and 19 person crews while the baitboats have 9 person crews. About 951 persons are currently employed on vessels.¹³ Seventy-two percent of the total are newly employed since 1980.

In addition to vessel employment, about 95 persons on average work in each of the 14 largest canneries. In total these canneries employ about 1,330 persons. Another 200 persons are estimated to be employed in vessel repair and maintenance occupations, primarily in Ensenada. Ensenada is also regularly used for maintenance by some U.S. tuna seiners, which provides ad-

ditional employment and income. The total direct employment in the Mexican tuna industry is estimated to be 2,481 (Appendix 1).

With the simplifying assumption that all persons employed earn the Mexican minimum wage (1,500 pesos/day or US\$3), these 2,481 jobs generate about US\$1.5 million in primary income per year. This estimate does not take into account additional people employed in auxiliary services, administration, marketing, and governmental agencies. It also does not include persons employed in fishing schools where crew and helicopter pilot training is given. The 2,481 jobs also underestimates the number of persons that will be employed when the industry is fully developed. The two new canneries to be built in Chiapas and Colima states will generate additional employment, which is not included in this estimate.

Because the Mexican tuna industry is still in an intermediate stage of development, the exact long run employment effects are difficult to estimate. If available information for the U.S. and Mexican industries and certain assumptions about wage rates are used, it is possible to extrapolate *maximum* employment and income levels, provided the Mexican industry develops along the same lines organizationally as the U.S. industry.¹⁴ With 951 persons currently employed on vessels and 1,330 in processing, the total expected support and auxiliary industry employment at full development would be 8,407. The total employment in the industry nationwide then would be 11,322 (Appendix 1). With the same assumption of minimum wage payments to all persons employed, the industry could generate over US\$6 million in domestic incomes annually. Each 1,200 GRT purse seiner with an average annual catch of 3,200 tonnes (based on four trips per year) could potentially generate 150 jobs, for 19 crew members, 20 processing workers, and 111 workers in auxiliary areas of maintenance, marketing, distribution, and sales.

These estimates reflect the total future employment in the industry once fully developed. The actual creation of new jobs related to the tuna industry development will depend on available maintenance, marketing, distribution, and sales channels. The amount of new employment opportunities generated will be directly related to the new channels that must be opened for these functions.

Summary

Resource availability does not appear to be an immediate problem for the Mexican fleet. However, resource availability in the Mexican EEZ could become a constraint if a fleet of 104 vessels becomes operational and if additional foreign tuna vessels are licensed to fish. Some purse seiners in the Mexican fleet have high IATTC efficiency ratings. These high producing purse seiners are predominantly privately owned. Public sector and social sector vessels are smaller and older with relatively lower efficiency ratings.

Although in theory there is adequate unloading, refrigeration, and processing capacity to accommodate the catches of the planned fleet, bottlenecks occur in certain ports due to lack of skilled labor, machinery, and support equipment. These bottlenecks increase costs and vessel time in port and reduce vessel production. Canning facilities include general food canning plants with a wide variation in levels of productivity.

Construction is underway on two new seafood-only canning plants, which are expected to alleviate some of the current canning bottlenecks for tuna. Tuna production costs are now too high relative to income levels in Mexico for canned tuna to be fully competitive in domestic food markets; thus reliance on export markets can be expected to continue.

INTERNATIONAL AND DOMESTIC MARKETS AND PRODUCT DISTRIBUTION

The catch of the new Mexican purse seiners was targeted for sale on the international market. Tuna was to be sold round for canning to other countries' processors. The social and public sector vessel catch was targeted for the domestic market. The imposition of the U.S. embargo as well as a major restructuring of the international tuna industry disrupted these plans. This section of the paper presents an overview of the historical and current product flows for Mexican caught tuna.

International tuna trade

Mexican tuna vessels sold their catch to several Mexican and U.S. canneries before the imposition of the U.S. import embargo. There were 39 vessels selling to U.S. and Mexican canneries in 1980. Of these, nine sold to PPM, eight to Star-Kist, ten to Van Camp, eleven to Bumble Bee, and one to Pando. After the imposition of the embargo about 80 percent of landings was sold to Mexican domestic canners.

Mexican tuna exports for 1977-85 are given in Table 8; all exports are frozen round tuna. The impact of the embargo is obvious. The industry apparently took about five years to establish new marketing channels for exports. Recently, the industry, using private brokers and the offices of SEPESCA, completed sales to Thailand, Canada, Italy, and Costa Rica, at American Tuna Sales Association (ATSA) prices FOB Ensenada. Other marketing channels are currently being pursued.

A continuing complaint of the tuna industry has been the divergence between the price set by the Mexican government (official price) and the world market price. Under conditions of the government vessel refinancing, the landings must first be offered to domestic canners before being offered on export markets. The domestic price increased by 73 percent between 1984 and 1986, but it is still only 90 percent of the quoted world price (Table 9).

Table 8. Mexican tuna exports by year and by destination, 1977-85

Year	United States (tonnes)	Other countries (tonnes)
1977	11,611	—
1978	17,853	—
1979	10,038	—
1980	4,730	—
1981	0	—
1982	0	6,050
1983	0	14,300
1984	0	16,000
1985	0	35,700

Sources: U.S. Department of Commerce 1986; Mexican tuna industry personal communications, June 1986; and Republic of Mexico BANPESCA internal report on the tuna industry (1985).

A domestic price increase for purse seiner vessels will provide an incentive for them to operate at full capacity. At the same time, any domestic price increase will increase costs of the final canned product, which would exacerbate the already low level of domestic sales.

The private sector of the industry has informally proposed to the Mexican government that the tuna fleet be segmented by gear and productivity levels to allow high producing vessels to catch up to capacity and sell larger sizes of frozen round or loined tuna on the world market and smaller sizes to domestic canneries. The state and social sectors' smaller vessels would target their product exclusively for the domestic canned market. This fleet segmentation proposal is controversial because the government enforces currency controls and sales to domestic canners. If a portion of the fleet is allowed free access to export markets, the result may be a circumvention of currency controls and decreased production (and employment) in domestic canneries.

Discussions are ongoing between U.S. canners and the Mexican industry to loin tuna in Mexico and to export the frozen loins to U.S. canners. The argument in favor of this type of arrangement is that it would take advantage of relatively cheap Mexican labor and the U.S. canners' experience in packing and marketing. This arrangement would also be advantageous for both sides

Table 9. Mexican domestic and international tuna prices in U.S. dollars per short ton and tonne, 1986

	Domestic price ^a		International price ^b		Difference between domestic and international price	
	(\$ per short ton)	(\$ per tonne)	(\$ per short ton)	(\$ per tonne)	(\$ per short ton)	(\$ per tonne)
Yellowfin tuna						
Greater than 9 kg.	540	594	825	908	285	314
3.5-9 kg.	520	572	725	798	205	226
2.0-3.5 kg.	400	440	630	693	230	253
1.0-2.0 kg.	270	297	500	550	230	253
Skipjack tuna						
Greater than 3.5 kg.	425	468	700	770	275	302
2.0-3.5 kg.	415	457	630	693	215	236
1.0-2.0 kg.	240	264	500	550	260	286

^aAt 540 pesos/US\$1 (February 1986).

^bQuoted at American Samoa and Puerto Rico, April 1986 ATSA prices.

Source: Mexican tuna industry personal communications. June 1986. Mexico City.

as Mexico could avoid import tariffs that are levied on imported canned tuna to the U.S. market. There are currently no U.S. tariffs on imports of fresh or frozen tuna. The 20,000 tonne per year export restriction to the United States as a condition of the embargo resolution still leaves over 50,000 tonnes to be sold on the world market, after deducting current international sales and estimated domestic consumption, given the 1986 fleet capacity in use (Table 2).

Domestic market conditions

There are 14 domestic canned tuna labels marketed by seven firms in Mexico. The market labels and estimated domestic market shares for 1980 are given in Table 10. Herdez is a private sector food distributor with the largest market share (36 percent) and the most aggressive marketing approach. In 1984 PPM's canner-

Table 10. Mexican tuna labels and estimated domestic market shares, 1980

Label	Market share (percent)
Domestic	
Herdez	36
Pando (no production since 1982)	21
PPM	13
• Conasupo (Delores, Ocean Garden, Vaquero)	
• Pescador	
• Consecha Del Mar	
Clemente Jacques (recently stopped production)	7
Ybarra	6
Del Monte	3
Other Domestic	3
• Calmex	
• Vermex	
• La Torre	
• No-brand	
• Gigante	
• Aurrera	
Total domestic market share	89
Imports market share	11
Total market share	100

Source: Republic of Mexico BANPESCA internal report of the tuna industry (1985).

ies had 35 percent of the market, and the private sector had about 65 percent,¹⁵ which was an increase of 22 percent for PPM over its share in 1980.

The PPM brands (Delores, Ocean Garden, Vaquero, Pescador, Consecha del Mar) are sold predominantly in government stores maintained for low income consumers. These brands also have recently been marketed in large retail grocery stores (for example, Sumesa) frequented by the general public. The PPM canneries are supplied by all vessel types. Private sector brands, Pando, Calmex, Clemente Jacques, La Torre, Herdez, and Ybarra have been marketed in chain grocery stores and small retail outlets for food products.¹⁶ No-brand labels and Aurrera, Del Monte, and Vermex are primarily marketed in large discount department stores and small corner groceries. About 70 percent of the food distribution in Mexico is dominated by large wholesalers.

Based on information from a BANPESCA report, the relative shares accruing to the various levels of the industry are as follows: of the final price 33 percent is received at the ex-vessel level, 45 percent by packers and wholesalers-distributors, and 22 percent by retail outlets. In the U.S. industry about 55 percent of the retail price is received at the ex-vessel level, about 28 percent at the wholesale level, and 17 percent at the retail level (Appendix 2).

Canned tuna distribution bottlenecks occur in Mexico with inventories accumulating in the larger cities and no product being available in the rural areas. The total consumption is the highest in Mexico City and the larger cities, but this may be a function of product availability. Storage of inventories for lengthy periods of time by large food wholesalers also distorts any estimates of current domestic consumption. Mexican government sources admit that reliable information on domestic sales is not available, and that canned or raw products not exported usually is attributed in official calculations to domestic consumption. The Mexican media reports that domestic tuna consumption is nearly 30,000 tonnes (round weight) per year, but this is probably an overstatement reflecting both consumption and inventories.

Estimates of domestic canned tuna consumption, calculated for this report, are given in Table 11. These estimates are based on the assumption that domestic consumption represented 20

Table 11. Estimated domestic consumption and inventories (round weight in tonnes) for the Mexican tuna industry, 1977-85

Year	Domestic consumption ^a	Inventories ^b
1977	3,909	4,026
1978	5,086	2,490
1979	6,397	15,548
1980	6,717	21,669
1981	7,052	63,455
1982	7,405	28,029
1983	7,775	5,686
1984	8,164	48,636
1985	8,572	49,828

^aEstimated as 20 percent of total catch until 1979 and then increased by 5 percent simple growth rate per year.

^bCalculated as total catches minus estimated domestic consumption and actual exports. The 1983 catches were considerably under previous years, resulting in a decline in inventories.

Sources: Based on data in Tables 2 and 8.

percent of total catches up to 1979, with a simple growth rate of 5 percent per year thereafter. The total food consumption in Mexico has declined by 30 percent since 1984 due to the recession. The decline in general food consumption probably affected domestic tuna consumption as well. The figures in Table 11 have not been adjusted to account for the effects of the national recession. The minimum annual consumption is probably 9,000 tonnes. Inventory estimates are also given in Table 11 for comparison. Inventories are calculated as residuals.

The two identifiable sources of low domestic consumption, aside from general recessionary conditions, are (1) the high price of tuna relative to other protein sources and incomes, and (2) the poorly developed internal marketing and distribution systems. As a result, the potential sales to the domestic market are difficult to predict. A population of over 81 million certainly offers the potential for tremendous sales. To stimulate domestic sales, industry sources recommend that the product form be differentiated in the future to provide consumers with a greater range of choice.

Summary

Mexico's 1977 National Fisheries Plan called for increased international market sales as well as for increased domestic sales. The imposition of the U.S. embargo closed the major world market to Mexican tuna exporters. The embargo and Mexico's financial crisis also generated unforeseen problems for the industry. However, in positive terms the embargo forced the Mexican industry to seek alternative markets for exports early in the development process.

Resolution of the U.S. embargo will result in maximum exports of 20,000 tonnes annually to the United States for at least two years (1986-88). This, combined with current exports of 35,000 tonnes, leaves over 50,000 tonnes to be sold in the domestic market or to markets yet to be developed. Accurate domestic consumption levels are unknown because of inadequate data. Estimates calculated for this paper indicate that a figure of 9,000 tonnes is probably the minimum amount currently being consumed.

Domestic sales constraints result from poor distribution channels outside major metropolitan areas and from the relatively high price of canned tuna. Although these limitations are largely outside the control of the industry itself, they require industry effort and expertise to resolve.

DEVELOPMENT POTENTIALS AND PROBLEMS

The success of development enterprises can be evaluated in terms of how well the enterprise fulfilled its goals, the condition of its financial health, or in terms of its ability to respond to changing economic or political conditions. Industry development over the long run also depends critically on the environment created by government. The interaction between government policy and industry success is an important element when the Mexican tuna development case is evaluated. For example, had the development of the tuna industry been less closely linked to national economic conditions, the financial situation of the industry might be healthier than it is now. Conversely, without the strong commitment of the Mexican government, the industry might have collapsed under the pressure of the U.S. import embargo. This section of the paper appraises the successes of the industry and identifies continuing short and long run problems.

Government and industry strategy

The national fishery plan stated several goals for the fishery sector, including the tuna industry. Catches have increased, and production of fishery products in general has increased. The goals of increased employment in the fishery sector and development of new domestic and international markets have been only partly met. A new purse seine fleet has been established, and the country's fisheries catch has been diversified to include tuna.

Several government and industry strategies clearly contributed to these successes and can be identified as follows:

- *Declaration of the Mexican EEZ (1978) and the presidential decree requiring license fees for foreign fishing vessels in the EEZ (1980)*. These events signaled to the Mexican private sector that the government would support investment in fisheries. The response of the private sector was strong and immediate. The development of a tuna industry was envisioned as a profitable business opportunity, as

well as a potential source of export earnings, employment, domestic tax revenues, and food protein.

- *Tax concessions.* The Mexican government granted income tax concessions to the industry to further encourage its development. This policy is consistent with protecting domestic industry during the start-up phase of development. As these concessions are removed, the industry will be increasingly exposed to world tuna market competition.

- *Free trade zone status.* The tuna industry development has primarily taken place in Ensenada, Baja California. Ensenada is a free trade area exempted from import and export tariffs levied on Mexican industries located elsewhere in the country. This policy is consistent with the plans that targeted the tuna catch for the international market. The Mexican tuna industry could export or import freely. There is little evidence that the tuna industry was ever intended to generate large export or import tax revenues. In fact, the free trade status of the tuna industry occurred by accident as the Baja peninsula has enjoyed free trade for a several years.

The government and industry currently recognize that free trade gives the Mexican industry an advantage over other countries' industries (for example, the Philippines) where tariffs are levied on exported raw tuna. An additional advantage of the free trade status is the ability to import tax-free parts for vessels. It is expected that a free trade zone status will be requested for the new canneries under construction in Colima and Chiapas states, which will give the canned products from these sites an advantage in world and domestic markets.

- *Technology acquisition.* The industry, with the support of the Mexican government, sought out and acquired technological expertise worldwide. The Mexican industry capitalized on the long-standing business contacts in the U.S. tuna industry and developed new contacts in the European markets. The proximity of the industry to San Diego, California also allowed it to employ displaced crews from the declining U.S. tuna industry. Although several former U.S. vessel captains have been employed as instructors in the Mexican fleet, this situation is considered temporary. These instructors often want to be paid in dollars, which imposes a financial burden that the industry wishes to avoid.

The highest producing vessel in the industry in 1985 had an all Mexican crew including the helicopter pilot.

• *Industry structure.* The Mexican tuna industry is structured much like that of the U.S. tuna industry. The purse seine owners are sophisticated entrepreneurs, often engaged in a wide range of business activity besides tuna production. General managers located at the port cities oversee the daily operations of vessels and crews. These managers are versed in business and usually have extensive backgrounds in the tuna industry. The SEPESCA and BANPESCA offices in the port cities also tend to daily operational matters related to finance, state cannery purchases, and policy. In addition, the fishermen's cooperatives have both local and national offices.

Policy issues are generally transacted in Mexico City among vessel owners, the national association of cooperatives, SEPESCA, BANPESCA and other government agencies. In some respects, this structure has significantly enhanced vessel productivity in Ensenada. Except for financial matters, there is relatively little intervention in the day-to-day operations of the vessels in the harvesting sector.

Development problems

Despite careful planning, the industry and the government now face a crucial turning point in tuna industry development. The major problems are primarily the result of the national financial crisis and the imposition of the U.S. embargo.

The most important short term problem facing the Mexican tuna industry in 1986 is cash flow. There are difficulties in providing the fleet with operational monies and resolving the external debt, both of which emanate directly from the domestic financial crisis.

The finances involved in support of the tuna industry have become complex and reflect the direct linkages between the industry and the national economy. The short term problem is the delay in payments to vessels from government operated cannery sales. These payments come through BANPESCA, which is also trying to collect vessel debt. Under the terms of the vessel refinancing and loan guarantees, BANPESCA required the vessels to meet specified performance standards. Several vessels have not met these standards. As a result, BANPESCA has had to coor-

dinate with the national treasury to ensure foreign vessel debt payments. At the same time, BANPESCA must decide whether or not to foreclose on those vessels that do not make debt payments. If foreclosures occur, BANPESCA will become the de facto owner of tuna vessels, a situation that most banks wish to avoid.

As SEPESCA and BANPESCA attempt to resolve the debt servicing problems of the vessel owners, it is politically difficult for either agency to seek special concessions for the fishing industry when so many other export-oriented industries in Mexico face similar financial problems. The decision to refinance tuna vessels in 1984 and assume the external debt no doubt subsidized some inefficient vessel operations that otherwise would have gone bankrupt. Without the U.S. embargo, operations will be less political, which will enable the Mexican government to enforce production requirements and discourage fishing by the marginal vessels. Both government agencies fully recognize the challenge and remain fully committed to establishment of a domestic tuna industry.

As the fleet is rationalized, longer term problems related to world markets and resource availability will become apparent. Mexican tuna exports, either round or canned, could depress world tuna prices in the future, forcing some Mexican vessels out of operation. These vessels would have to be converted or sold at a probable loss. Last, as Mexico allows more foreign fishing in its EEZ, resource problems may become relevant.

Summary

In summary, the industry has survived domestic and international crises because of the determination of the Mexican government to exploit the tuna resources in its EEZ and because of the ability of industry and government to cooperate, albeit in a sometimes uneasy relationship.

IMPLICATIONS FOR PACIFIC ISLAND REGION

The significance of the development of the Mexican tuna industry for the Pacific islands region is twofold. First, the tuna industry in Mexico has dealt with economic and political problems relevant to many developing countries. The lessons applicable to other countries that manage or develop tuna resources include credit limitations, strength of the national economy, trade-offs between public and private sector well-being, and government/industry collaboration in investment. Second, the Mexican industry now has potential to become a major agent in world tuna markets. Decisions made by the industry in Mexico could affect investment and marketing opportunities for industries in the Pacific islands.

Lessons from the Mexican case

Economic development, even of an export-oriented industry, takes place within a national context. The Mexican tuna industry survived the domestic financial crisis and the U.S. embargo because the Mexican government was able to provide heavy subsidies. These subsidies took several forms: credit guarantees, tax free imports and exports in Ensenada, purchase and inventory of tuna catches, biological and economic research, and domestic raw tuna price stability.

In the early planning stages the government chose to let the private sector operate where it was the most efficient—in the harvesting sector. This decision minimized the political favoritism that is often observed in state-run enterprises leading to charges of inefficiency and corruption.

The government and industry had sufficient institutional flexibility to decrease the size of the planned fleet, organize and implement the vessel refinancing program, and maintain political integrity in responding to the U.S. embargo. It is yet to be seen whether this flexibility will succeed in overcoming the remaining problems of bottlenecks in ports and processing and the development of a domestic demand for tuna.

In at least three instances, however, planning and cooperation between government and industry appear to have failed. First, any exporting industries of primary commodities are sensitive to fluctuations in the world prices of those commodities. The Mexican planners apparently did not foresee either the collapse of tuna prices or the international restructuring of the tuna industry. Over the long term however, both these events possibly could work in favor of the Mexican industry; that is, the industry, now in its intermediate stage of development, may be better equipped to withstand further price decreases than a younger industry.

A second instance of failure to collaborate occurred with the declaration of the Mexican EEZ and the foreign licensing requirement, which led to imposition of the U.S. embargo. The Mexican government, to fulfill its commitment to the domestic tuna industry, then had to subsidize the industry for survival. It is still debatable as to why the embargo lasted as long as it did, but clearly the Mexican government policy was in conflict with industry development goals.

In the third instance, the national debt crisis generated complex internal problems for the Mexican tuna industry; however, the government in 1986 appears willing to participate in the resolution of these problems to the extent possible, given its fiscal constraints.

The tuna industry in Mexico has overcome a number of short term problems. As the industry enters the intermediate development stage, the strength of Mexico's national economy will continue to have strong influences on the industry.

Mexico and the Pacific islands region

Little debate exists over the fact that sometime in the future the Mexican tuna fleet, rationalized at an efficient size, will become a distant-water fleet seeking alternative fishing grounds. The central and western Pacific offers one of these alternatives. Several conditions will determine the level of interaction between the Mexican industry and the tuna-rich nations in the Pacific islands.

- *Size of rationalized fleet.* As previously discussed, the lifting of the U.S. embargo will help to normalize operations of the Mexican industry. In addition, as Mexican government subsidies and concessions are removed, the operating fleet will be increasingly

exposed to the competitive pressures of world tuna markets. This pressure will probably drive some Mexican tuna vessels out of operation. The ultimate size of the Mexican fleet relative to the eastern Pacific resource will determine whether or not the fleet seeks alternative fishing grounds.

- *Domestic market development.* If the domestic market in Mexico is sufficiently developed, the industry may seek alternative fishing grounds in order to supply this market. Market expansion is likely to require greater amounts of raw product as well as transshipment facilities and additional canning capacity. The most efficient location of this processing capacity would be near the distant-water fishing grounds. Therefore, a second condition, which may generate interaction between the Mexican tuna industry and the Pacific island nations, would be the need to supply an increased domestic demand for tuna.

- *Location choice.* Either scarcity of domestic tuna resources or increased domestic demand could induce the Mexican fleet to fish outside the Mexican EEZ. The choice of location will depend on political considerations as well as economic costs. Several Latin American countries including Mexico have been negotiating treaties for fishing rights under the organizational auspices of Organización Latinamericana de Desarrollo Pesquero ([OL-DEPESCA] Latin American Organization for Fishery Development). The negotiating countries include several that have neither fleets nor effective means of enforcing EEZ claims. The Mexican fleet could in theory become a "pirate fleet" along the Central and South American coasts. The probability of this will ultimately depend on the Mexican government's policy with respect to regulation of domestic fleet activities outside the Mexican EEZ.

Even if the Mexican fleet were to fish farther south along the Pacific coast of Central and South America, the fleet will face increasing fuel and transshipment costs as distances increase. It is highly improbable that joint ventures in fuel depots, transshipment facilities, or processing will develop between Mexico and those Latin American countries that have domestic capabilities for these inputs in tuna production. More likely, the Mexican industry (and government) will look to joint ventures with countries that have little or no domestic industry. These opportunities are available predominantly in Central America (Honduras, Nicaragua) and in the Pacific islands region.

Consequently, a third condition, which could encourage interaction between a Mexican distant-water fleet and the Pacific island nations, would exist either if the OLDEPESCA negotiations break down or if the costs of fishing the central and western Pacific relative to the Latin American coast are less.

Summary

Joint venture opportunities between Mexico and Pacific island countries could take any number of forms, ranging from direct purchase of fishing access rights to inter-country industrial development projects. Whatever the actual outcome, two points must be considered: credit availability and fuel requirements. The status of Mexico's national economy will continue to affect the operations of the tuna industry even in a distant-water capacity. Foreign exchange and credit availability will be continuing problems.

Barter among developing countries is increasingly being used in trade packages. It would be realistic to suppose that fishing deals with Mexico could include a barter component. Barter has obvious drawbacks for the Pacific island countries in that Mexico may not produce the goods and services that are needed by these countries. However, the advantage is that the barter arrangement circumvents credit and foreign exchange problems, which can be severe.

The ability of the Mexican tuna industry to become a major distant-water fishing power in the central and western Pacific will depend on continued Mexican government support. One example of potential problems with government support is related to fuel requirements. It has been suggested that *Petroleos Mexicanos* ([PEMEX] Mexican National Petroleum Company) underwrite placement of fuel depots around the Pacific for use by a distant-water fleet. Although theoretically attractive, this plan effectively requires special treatment for the tuna industry. Therefore although economically feasible, such a plan may not be politically acceptable.

Conditions in the future probably will be conducive to collaborative efforts in fishing between Mexico and the Pacific island nations. The success of any interaction will be affected by the fact that the parties involved will be those developing countries that need to conserve foreign exchange and credit. Creativity

in negotiations will be called for in a way not required in negotiations with the industrialized countries (for example, the United States). This creativity in negotiations has the potential of enhancing the economic development of the countries involved, as well as freeing them from the credit constraints imposed by domestic and international debt problems.

APPENDIX

Appendix 1. Calculation of job creation and income generated from development of Mexican tuna industry, 1986-87

		1986	1987
Vessel jobs			
Crew number	Vessel size		
19	1200 GRT	160	432
16	680 GRT	665	874
9	< 680 GRT	126	279
	Total	951	1,585
Processing jobs			
95 persons employed in each of			
14 largest canneries		1,330	1,330
Auxiliary service jobs			
Maintenance, distribution, training,			
marketing, sales		200	(8,407) ^a
Total jobs		2,481	11,322
Total income			
Incomes @ 240 days employed at			
1,500 pesos/day rural minimum wage.			
(600 pesos/U.S. \$1)		\$1.5 million	\$6.8 million

^aBased on ratio of 26 percent employed on vessels and in processing and 74 percent employed in auxiliary services.

Appendix 2. Relative shares of final price accruing to tuna industry by level and by country

	Relative share of final price (percent)	
	Mexico	U.S. ^a
Ex-vessel level	33	55
Packers and wholesale distributors	45	28
Retail level	22	17

^aCalculated from information in Republic of Mexico, BANPESCA internal tuna report (1985) and King and Bateman (1985).

NOTES

1. The last five countries have a single vessel or company fishing in the eastern Pacific and therefore are grouped in the data reports from the IATTC.
2. United Nations (1984).
3. The SAM (Sistema Alimentos Mexicanos) program as such was phased out by the de la Madrid administration. Tuna is still listed as a basic foodstuff and is covered by price controls.
4. Mexico is among the top ten shrimp producers in the world after India, Indonesia, the United States, China, Thailand, and Malaysia.
5. Discussions are underway among government officials to cancel future construction and rationalize the fleet at 89 vessels.
6. This total is both government and social sector participation combined.
7. This estimation is based on 1982 world prices and simulated sales to the U.S. market during the period 1980-85. Hudgins (1986).
8. The future involvement of the Mexican fleet in the central and western Pacific are discussed below.
9. IATTC. 22 July 1986. Weekly Report No. 29.
10. Calculations used 1984 costs and 300 pesos/US\$1 exchange rate.
11. Actual unloading and other capacity measures refer to that which is currently usable without additional equipment or modification.
12. Domestic marketing, sales, and distribution are operated by large private sector food conglomerates. Reliable data on 1986 domestic consumption and brand name market share were not available at the time of this study.
13. Employment estimates are based on interviews conducted by the author in Ensenada, Baja California (September 1985).
14. See King and Bateman (1985).
15. Unpublished Mexican government study.
16. Pando ceased business in 1982 and Clemente Jacques in 1984.

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