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The Political Economy of Marine Fisheries Development in Peru, Chile and Mexico*

ALONSO AGUILAR IBARRA, CHRIS REID
AND ANDY THORPE

Abstract. Latin American fish production has expanded significantly in recent years. Unfortunately, as management systems in the three major Latin American fish producing countries have not developed at the same pace, all three countries now experience problems of overfishing and industrial overcapitalisation. This article examines the distinctive national fisheries development programmes that have led to this ‘tragedy of the oceans’. By comparing and contrasting the Peruvian, Chilean and Mexican management styles, it offers a critical assessment regarding the likely direction of future Latin American fisheries policy.

Introduction

Exploitation of abundant natural resources has long underpinned economic development in Latin America.¹ More recently, several authors have identified new forms of resource use, notably exports of non-traditional agricultural and forestry products, that have continued this attractive pattern.² With a few exceptions,³ marine fisheries development

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¹ V. Bulmer-Thomas, *The Economic History of Latin America Since Independence*, (Basingstoke, 1994), pp. 15–18.

² See, for example: M. Conroy et al., *Fruits of the Crisis: Gambling on Nontraditional Agriculture*, (Austin, 1994); E. Silva, ‘The Politics of Sustainable Development: Native Forest Policy in Chile, Venezuela, Costa Rica and Mexico’, *Journal of Latin American Studies*, vol. 29 (1997), pp. 457–93.

³ R. A. Schurman, ‘Snails, Southern Hake and Sustainability: Neo-liberalism and Natural Resource Exports in Chile’, *World Development*, vol. 24 (1996), pp. 1695–1709;

is missing from this debate. This is unfortunate as fisheries are important in a number of Latin countries, not only contributing to export earnings, but also providing invaluable employment opportunities in coastal regions. Moreover, as the region is one of the most important for world fish production, it greatly influences the course of international fisheries trade. Consequently, concern for the sustainability of Latin fisheries development extends beyond the region.⁴

This article evaluates recent marine fisheries development in the three foremost Latin fishing nations: Peru, Chile and Mexico.⁵ It traces histories of fisheries development characterised by overfishing and overcapitalisation, problems that are only partially explained by the so-called 'tragedy of the commons' associated with open access to resources.⁶ We contend that a more satisfactory explanation of fisheries development must examine the influence of government policies in each country. National macroeconomic development strategies have spawned sectoral legislation and development programmes that have, as we document, exacerbated the 'tragedy'. While in each country the approval in the early-1990s of new fisheries laws demonstrated growing local concerns over the sustainability of current fishing practices, the resulting regulatory regimes, although offering some prospect for improved fisheries management, may well be unable to prevent a series of collapses in the region's fish stocks.

The article is organised as follows. First, it establishes an analytical framework that identifies the special characteristics of marine fisheries, explaining why overfishing, overcapitalisation, and conflicts are likely to emerge in the absence of effective access control mechanisms. Next, it

M. Vásquez León and T. R. McGuire, 'La Iniciativa Privada in the Mexican Shrimp Industry', *Maritime Anthropological Studies*, vol. 6 (1993), pp. 59–73; J. Peña-Torres, 'The Political Economy of Fishing Regulation: The Case of Chile', *Marine Resource Economics*, vol. 12 (1997), p. 253–280.

⁴ FAO, 'Review of the State of World Fishery Resources: Marine Fisheries', *FAO Fisheries Circular*, 920, (1997); F. T. Christy, 'The Development and Management of Marine Fisheries in Latin America and the Caribbean', *Inter-American Development Bank Policy Research Paper*, (1997); World Wildlife Fund, *The Footprint of Distant Water Fleets on World Fisheries*, (Godalming, 1998).

⁵ Peru, Chile and Mexico were respectively ranked second, third and sixteenth among world fish producers in 1995. United Nations Food and Agriculture Organisation (FAO), *Yearbook of Fisheries Statistics for 1995*, vol. 80 (1997), p. 93. All figures are those reported by the FAO, unless otherwise stated. There are some minor discrepancies between figures reported by the FAO and national agencies, owing to reclassification to allow international comparisons.

⁶ Hardin's well-known 'tragedy of the commons' model has greatly influenced the extant literature on fisheries development. G. Hardin, 'The Tragedy of the Commons', in G. Hardin and J. Baden, (ed.), *Managing the Commons*, (San Francisco, 1977), pp. 16–30.

presents comparative case studies of Peru, Chile and Mexico to illustrate the variety of development strategies and management regimes which have been deployed in the region to date. It concludes by highlighting the similarities and differences in approach to fisheries development/management within the region, identifying which of the currently available policy tools and instruments offer the best prospects for an effective Latin American fisheries policy.

Latin American Fisheries and Fisheries Development

Victor Bulmer-Thomas has outlined the key factors underlying the historical pattern of export-led growth based upon primary production in Latin America.⁷ In his model, resource endowments, linkages to secondary industry, and demand in international markets defined the potential for export-led growth, a growth which was contingent upon mobilising capital, labour and the resources of the state. With two qualifications, this model provides a firm foundation for understanding marine fisheries development in the region. First, Latin American nations have successfully enhanced their marine fisheries endowments through extended territorial jurisdiction, both before and during the crucial Third United Nations Conference on the Law of the Sea (UNCLOS III).⁸ Second, marine fisheries differ from most of the other natural resources that have underpinned Latin America's economic development in that they are mostly common property or, more correctly, open access resources.

The problems inherent in open access fisheries are threefold. First, while a fishery can yield a stream of benefits (resource rents) in perpetuity,⁹ open access encourages too many capital and labour inputs into the fishery relative to its biological productivity. Eliminating overcapitalisation is problematic. While firms normally react to declining incomes by leaving an industry, low opportunity incomes and asset

⁷ Bulmer-Thomas, *Economic History*, pp. 14–18.

⁸ Mexico's declaration of exclusive rights to its continental shelf resources in 1945 precipitated other claims, most notably the Chilean and Peruvian declaration of 200-mile 'territorial' seas in 1947. These claims, formalised by the 1952 Santiago Declaration, encouraged similar claims in the 1950s and 1960s. Other Latin nations declaring 200-mile territorial waters include: El Salvador (1950), Honduras (1951), Nicaragua (1965), Argentina (1966), Panama (1967), Uruguay (1969), and Brazil (1970). See: F. Orrego Vicuña (ed.), *The Exclusive Economic Zone: A Latin American Perspective* (Colorado, 1984); F. Orrego Vicuña, 'Trends and Issues in the Law of the Sea as Applied in Latin America', *Ocean Development and International Law*, vol. 26 (1995), pp. 93–103; F. Paolillo, 'The Exclusive Economic Zone in Latin American Practice and Legislation', *Ocean Development and International Law*, vol. 26 (1995), pp. 105–25.

⁹ An extensive literature details the problems of fisheries development, drawing upon a core 'bioeconomic' model. See, for example: S. Cunningham et al., *Fisheries Economics: An Introduction*, (London, 1985).

specificity present significant barriers to exit. Without effective vessel resale markets or decommissioning grants fishing incomes can fall to very low levels before participants leave the fishery.

Second, the ensuing inefficiency ensures that potential rents are partially or fully dissipated. If production were limited and excess inputs redeployed, then some portion of the rent could be collected through taxation or the sale of fishing rights. This would increase the benefits Latin nations received from their endowments. The benefits of such a scheme should be clear. Capital is scarce everywhere, especially in developing countries. Collecting and investing this rental income, besides freeing excess inputs, could generate alternative employment alongside a profitable fishing industry.

Finally, under open access conditions, it is probable that resources will be harvested at a rate exceeding their growth (or more properly, beyond their maximum sustainable yield – MSY). This results in the depletion of fish stocks, possibly to the point of extinction. The failure of many important fisheries shows this is not an abstract possibility,¹⁰ although neither is it inevitable. The traditional method used to conserve fish stocks and prevent overfishing is to set a total allowable catch (TAC) for the fishery. Typically, TACs aim to restrict fishing effort to its MSY level. Once these ‘safe biological limits’ are reached, fishing is prohibited. But TACs do not, in themselves, address the overcapitalisation issue. Consequently, many fisheries economists recommend that the designated TAC is distributed to industry participants in the form of individual transferable quotas (ITQs) – quasi-property rights that restrict inputs to the fishery.¹¹ Under these rules failure to acquire an ITQ effectively forces vessels out of the fishery, thereby reducing fishing effort and increasing harvesting efficiency. However, fisheries management is not simply geared to the goals of conservation and efficiency. Improving employment and incomes in fishing communities and increasing domestic food production and export earnings, are objectives that compete with conservation and economic efficiency for priority in the formulation of domestic fisheries policies.¹²

¹⁰ Cushing gives many examples of overfishing between the late-nineteenth century and the present. D. H. Cushing, *The Provident Sea*, (Cambridge, 1988).

¹¹ Cunningham suggests that ITQs have become the conventional wisdom among fisheries economists, despite widely-held reservations about their distributional consequences. See: S. Cunningham, ‘Fishermen’s Incomes and Fisheries Management’, *Marine Resource Economics*, vol. 9 (1994), p. 245.

¹² The problems of multiple objectives in fisheries management are discussed in: A. T. Charles, ‘Bio-Socio-Economic Fishery Models: Labour Dynamics and Multiobjective Management’, *Canadian Journal of Fisheries and Aquatic Sciences*, Vol. 46 (1989), 1313–1312; C. Bailey and S. Jentoft, ‘Hard Choices in Fisheries Development’, *Marine Policy*, vol. 14 (1990), pp. 333–344.

Table 1. *Principal Fisheries¹ and Status of Exploitation²*

Peru	
Peruvian anchovy	Recovering, Fully/overexploited
South American pilchard	Depleted, Fully/overexploited
Jack mackerel	Moderately/fully exploited
South Pacific hake	Fully/overexploited
Chub mackerel	Moderately exploited
Chile	
Jack mackerel	Moderately/fully exploited
South American pilchard	Depleted, Fully/overexploited
Peruvian anchovy	Recovering, Fully/overexploited
Araucanian herring	Fully/overexploited
Patagonian grenadier	Fully/overexploited
Chub mackerel	Moderately exploited
South Pacific hake	Fully/overexploited
Patagonian hake	Fully/overexploited
Mexico	
Californian pilchard	Moderately/fully exploited
Yellowfin tuna	—
Shrimp	Fully/overexploited
Californian anchovy	Depleted, Moderately/fully exploited

¹ Principal species are those for which landings exceeded 50,000 tonnes per annum in at least one year between 1980 and 1995 according to the FAO. Species are ranked in descending order according to recorded landings in 1995. Shellfish and farmed species such as salmon are excluded. Source: FAO, *Yearbook of Fisheries Statistics*, (Rome, annual).

² FAO, 'Review of the State of World Fishery Resources: Marine Fisheries', *FAO Fisheries Circular*, 920, (Rome, 1997).

Attempts to devise locally appropriate fisheries management strategies are further hampered by biological and environmental fluctuations, these being more severe in Latin America than in other regions. The most important commercial fisheries are found in the Southeast Pacific Ocean, where the upwelling Humboldt current sustains large populations of small low unit value pelagic (surface dwelling) species such as Peruvian anchovy, South American pilchard, Chilean jack mackerel and Araucanian herring. Every two to seven years the Humboldt current is disrupted by El Niño. This change in currents raises sea surface temperatures, reducing food supplies and so increasing natural mortality, while encouraging shoals to move to cooler waters.¹³ Similar effects are observed in the East Central Pacific fisheries of Mexico, where the Californian anchovy and Californian pilchard fisheries are also vulnerable

¹³ El Niño arises from a relaxation of the trade winds, which slows the upwelling of the Humboldt current allowing warmer water from the Western Pacific to move eastwards. See: S. G. H. Philander, *El Niño, La Niña and the Southern Oscillation*, (San Diego, 1990).

to the effects of El Niño. These 'El Niño vulnerable' pelagic stocks, as shown above (Table 1), make up most of the total Latin catch. Demersal (groundfish) species, such as the Patagonian grenadier, South Pacific hake and Patagonian hake,¹⁴ highly migratory tuna, and shrimp stocks found in the inshore waters of most Latin states are less sensitive to these fluctuations.

As Table 1 shows, the main species fished by Peruvian, Chilean and Mexican fishers are mostly fully or overexploited. Consequently, few if any gains are possible from more intensive or extensive fishing, and a reduction in fishing effort in the region would almost certainly improve incomes and productivity.¹⁵ Yet although each country now finds itself needing to resolve problems of sectoral overcapitalisation and overfishing, these common problems are a consequence of markedly different national fisheries development trajectories, as the next three sections make clear.

Peruvian fisheries development

In the 1960s the most important Latin American fishing sector was to be found in Peru. As Figure 1 shows, the industry experienced extremely rapid growth between the early-1950s and 1970, when Peru was the world's leading fishing nation with catches exceeding 12 million tonnes per annum.¹⁶ Catches, which consisted almost entirely of Peruvian anchovy or other small pelagic fish,¹⁷ were processed into fish meal and oil for export.¹⁸ In the manner described earlier, expanding markets, capital investment, and state support encouraged the export-led growth of these industrial fisheries. Growing international fishmeal markets, technology transfers,¹⁹ changes in exchange controls, inward investment and short-

¹⁴ South Pacific hake are also known as silver or Chilean hake, and Patagonian hake as southern hake.

¹⁵ Christy, 'Development and Management of Marine Fisheries', p. 35.

¹⁶ For further discussion of developments in the 1950s and 1960s, see: M. Roemer, *Fishing for Growth: Export-Led Development in Peru, 1950-1967*, (Cambridge (Mass.), 1970); W. P. Appleyard, 'Peru: A Case Study in the Establishment of a Food Fish Industry for a Developing Country', *Journal of the Fisheries Research Board of Canada*, vol. 30 (1973), pp. 2236-2241; B. B. Smetherman and R. M. Smetherman, 'Peruvian Fisheries: Conservation and Development', *Economic Development and Cultural Change*, vol. 21 (1973), pp. 338-351; J. R. Coull, 'The Development of the Fishing Industry in Peru', *Geography*, vol. 59 (1974), pp. 322-32, R. Thorp and G. Bertram, *Peru 1890-1977: Growth and Policy in an Open Economy*, (Basingstoke, 1978), pp. 180-2, 242-51.

¹⁷ Small pelagic species constitute about 90% of the Peruvian catch.

¹⁸ Peruvian exports accounted for around 60 per cent of the international fishmeal trade at the time. E. Leoncio Segura, 'An Econometric Study of the Fish Meal Industry', *FAO Fisheries Technical Paper*, no. 119 (1973), pp. 1, 22.

¹⁹ The national fleet grew from 433 vessels in 1959 to 1,846 vessels by 1964, the fleet's gross tonnage and hold capacity increasing by 750% over the same period. These

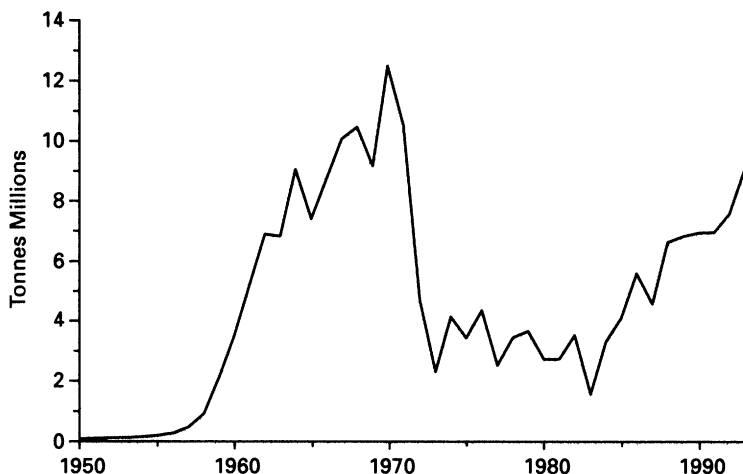


Fig. 1. Peruvian catches 1950-1995. Source: FAO, *Yearbook of Fisheries Statistics* (Rome, annual).

term loans from Peruvian banks to local entrepreneurs,²⁰ were key factors underlying this growth. Significant backward and forward linkages were established.²¹ Unfortunately, this rapid growth generated problems that continued through the 1970s and beyond.

The saturation of international fishmeal markets first manifested itself in 1960. Despite national and international attempts to regulate the trade, processors struggled to keep reduction plants active.²² Concurrently, rapid fleet expansion and technological change were having a deleterious impact upon fish stocks, causing fishing costs to rise and profitability to diminish. This was compounded by the 1964-5 El Niño event. Although the government introduced a month-long closed season (*veda*) in August 1965, extended to three months in subsequent years, this only encouraged more intensive harvesting when the fishery was open.²³ While the fishery quickly recovered, the problems associated with high levels of investment and export dependency became more acute. The continued saturation of

vessels employed the sophisticated fishing methods used in the United States. L. K. Boerema et al., 'Report on the Effects of Fishing on the Peruvian Stock of Anchovy', *FAO Fisheries Technical Paper*, no. 55 (1965), p. 6.

²⁰ Leoncio Segura, 'Econometric Study', p. 7.

²¹ Roemer, *Fishing for Growth*, p. 112-3; Thorp and Bertram, *Peru 1890-1977*, pp. 250-1.

²² Peruvian involvement in the international Fish Meal Exporters Organisation (FMEO) and the formation of fishing and processor associations (the Sociedad Nacional de Pesquería (SNP) and the Consorcio Pesquero de Peru (CPP)), are discussed in: Leoncio Segura, 'Econometric Study', p. 19.

²³ Smetherman, 'Peruvian Fisheries', pp. 345.

the international fishmeal market had seen processors respond by inventory-building. Subsequent state intervention (on the processors' behalf) led to reduced export taxes in October 1967 which, combined with a sharp devaluation, helped restore processors' margins.²⁴

State intervention in the sector increased under Velasco Alvarado's military-reformist government (1968–75). A new policy framework was drawn up, the constitutional status of fisheries resources as state property was confirmed, and an independent Ministerio de Pesquería was created in 1970. Within this ministry, the Empresa Pública de Servicios Pesqueros de Perú (EPSEP) held responsibility for the artisanal fisheries, while the Empresa Pública de Comercialización de Harina y Aceite de Pescado (EPCHAP) was responsible for the industrial fisheries. The ambitious 1971–6 National Development Plan promised to triple food fish catches, support the growth and modernisation of artisanal co-operatives, and improve the market infrastructure and retail distribution networks. Increased intervention initially coincided with improved fish meal prices, reduced inventories and improved fishing returns.²⁵

The collapse of the Peruvian anchovy fishery in the early 1970s is one of the defining events of modern fisheries development. Several assessments during the late-1960s and early-1970s had confirmed that anchovy stocks had reached a critical status due to overfishing.²⁶ However, both the industry and the government chose to ignore these warnings. The government feared that the imposition of access restrictions would provoke unemployment in fishing communities, falling export earnings and tax revenues.²⁷ The 1972 El Niño initially disguised the true extent of overfishing by driving anchovy stocks inshore where they were more easily fished.²⁸ Furthermore, anchovy, like other small pelagic fish, form tight shoals in defence against predation. As the stock declines, it typically forms fewer shoals, albeit comparable in size to those which obtained previously, but distributed over a reduced area. This intensifies the stocks' vulnerability to modern fishing methods, especially purse seining, and ensures that catch rates do not immediately fall in response

²⁴ Ley de Fomento de la Industria Pesquera, no. 16694.

²⁵ Leoncio Segura, 'Econometric Study', p. 200.

²⁶ L. K. Boerema and J. A. Gulland, 'Stock Assessment of the Peruvian Anchovy (*Engraulis ringens*) and Management of the Fishery', *Journal of the Fisheries Research Board of Canada*, vol. 30 (1973), pp. 2226–2235; J. Csirke, 'Recruitment in the Peruvian Anchovy and its Dependence on the Adult Population', *ICES Rapports et Procès-Verbaux des Réunions*, vol. 177 (1980), pp. 307–313.

²⁷ C. N. Caviédes and T. J. Fik, 'Modelling Change in the Peruvian-Chilean Eastern Pacific Fisheries', *Geojournal*, vol. 30 (1993), p. 370.

²⁸ For a fuller explanation, see: J. Csirke, 'Small Shoaling Pelagic Fish Stocks', in J. A. Gulland (ed.), *Fish Population Dynamics: The Implications for Management*, 2nd edition, (Chichester, 1988), p. 287.

to stock decline. The combination of overfishing and environmental change caused the adult anchovy stock to collapse, adversely affecting stock growth and catch rates in 1972 and for the subsequent three years (as is clearly evident in Figure 1).

The government responded by closing the fishery between July 1972 and March 1973. This caused severe economic distress throughout the sector, forcing public compensation to producers and processors.²⁹ Once it became apparent that stock recuperation would not be immediate, in May 1973 the government 'nationalised' the anchovy fleet and processing plants.³⁰ A new parastatal agency PESCA PERU was given exclusive access to remaining anchovy stocks and a monopoly of fishmeal production.³¹

Hereafter, the conduct of the fisheries became closely allied to the pattern of contemporary economic policy. As in other industries, legislation encouraged worker participation in PESCA PERU. Employees were entitled to a percentage of the enterprise's profits, could nominate representatives to attend meetings of shareholders, with 12 per cent of PESCA PERU's profits being assigned to an 'employees fund' designed to build up worker shareholdings in the company. Two factors conspired to undermine the new *modus operandi*. First, individual fishing enterprises within PESCA PERU were compelled to contribute a share of their profits to a 'compensation scheme', the proceeds being re-distributed so as to reduce income disparities within the company. However, by penalising efficiency (and subsidising inefficiency) this merely discouraged investment. Second, the sector remained extremely vulnerable to fluctuations in anchovy stocks. Hence, even though 1976's harvest of 3.9 million tonnes promised the fishery's revival, renewed fears of a stock collapse following the 1976-7 El Niño forced the fishery's closure several times during 1977.³²

Recognition of these problems led the Morales Bermúdez government (1975-80) to remove workers' voting rights, and dissolve the employee fund and the compensation scheme. In order to encourage greater private enterprise involvement in the sector, the government sold off PESCA

²⁹ Boerema, 'Stock Assessment of the Peruvian Anchovy', p. 2234.

³⁰ Thorp and Bertram point out that the 1971 Fisheries Law had already established state control of marketing, introducing provisions for the elimination of foreign ownership and the introduction of worker participation in the sector. Thorp and Bertram, *Peru 1890-1977*, p. 302. The industry's assets at the time of the collapse were estimated at US\$120 million, compared to debts of \$227.5 million. W. Royce, *Fishery Development*, (Orlando, 1987), p. 106.

³¹ Private participation was not precluded - although private entrepreneurs were obliged to produce 10 cases of canned fish per tonne of fish, before they could assign the residual to meal production.

³² 'Peru Closes Anchovy Fishery', *Marine Fisheries Review*, vol. 39, no. 8 (1977), p. 32.

PERU's surplus vessels, along with all EPSEP's plant and vessels.³³ Privately-owned vessels were obliged to fish other underexploited pelagic stocks – pilchard catches increasing from 175,000 tonnes to 1.26 million tonnes between 1976 and 1978, jack mackerel harvests rising from 54,000 tonnes to 387,000 tonnes between 1976 and 1979.³⁴ Anchovy fishing remained closely regulated, however.

Redirecting effort did not resolve overfishing, but simply extended it to new fisheries. In late 1980, the ministry announced the closure of the pilchard fishery in an attempt 'to manage pilchard stocks more carefully than the decimated anchovy stocks were managed'.³⁵ It re-opened in 1981 with an intricate system of controls designed – unsuccessfully, as it transpired – to limit catches to 1 million tonnes. Significantly, with production in its two main fisheries curtailed, Peru was displaced by Chile as South America's leading fishing nation in 1980.

President Belaúnde Terry's administration (1980–5) sought to rationalise PESCA PERU further, especially after the severe 1982–3 El Niño event once again depleted anchovy stocks. Yet, although the number of fishmeal plants had been cut from 99 at the time of nationalisation to 37 by late-1981, the government resisted IMF pressures to close the enterprise and write-off its US\$254 million debt.³⁶ Instead, PESCA PERU continued to crowd out private fishmeal producers. Many firms flouted the regulations, however, as fishmeal production offered more rapid returns than processing for consumption, so frustrating the Belaúnde administration's attempt to redirect fisheries production.³⁷

President Alain García's administration (1985–90), recognising that these state-private sector conflicts were gradually undermining fisheries management, emphasised the importance of co-operation in formulating sectoral development priorities. As one former ministry official explained in early 1986:

People here have very extreme views about the fishing industry. They either think that everything should be run by the state and anything the private sector does is wrong: or the exact opposite. But the Ministry realises that it needs the contribution of private industry.³⁸

³³ 'Peruvian Fishing Law Modified to Attract Capital Investment', *Marine Fisheries Review*, vol. 41, no. 4 (1979), p. 36.

³⁴ FAO, *Yearbook of Fisheries Statistics*, (Rome, annual).

³⁵ Jack mackerel stocks remained unregulated. 'Peruvian Fisheries Developments, 1980–81', *Marine Fisheries Review*, vol. 43, no. 7 (1981), p. 27.

³⁶ PESCA PERU contracted sharply during the early 1980s, its employees decreasing from 7,000 in 1982 to 1,100 in 1984. 'Peru Loses More Meal Plants', *Fishing News International*, (Oct. 1981), p. 4; 'PESCA PERU Faces a Big Cut in Fish Meal Capacity', *Fishing News International* (Sept. 1984), p. 8.

³⁷ 'Peru Puts Food Fish First', *Fishing News International*, (Sept. 1980), p. 1.

³⁸ 'Peru Expects Larger Catch This Year', *Fishing News International*, (Jan. 1986), p. 26.

A renewed commitment to raising food fish production saw a supplementary 5 per cent tax levied on fishmeal exports. This supported a Reactivation Fund, charged with modernising the artisanal sector. The fund was also expected to purchase vessels for a reconstituted state fishing fleet (FLOPESCA)³⁹ as:

purse seiners built in the 1960s and early 1970s make up 85 per cent of the industrial fleet that fishes along the coast. Most (82 per cent) of the fleet is over twenty years old, in poor repair, and fitted with outmoded gear; the boats cannot handle or conserve their catches properly, and their operating costs are high. The fleet thus turns less of a profit and has trouble competing on the domestic, much less on export markets, with good quality products that could reap acceptable profit margins.⁴⁰

However the primary obstacles to fleet re-capitalisation were the industry's indebtedness, and the uncertainty of future fishing incomes due to stock variability. The latter problem was compounded by the intermittent prohibition of anchovy and pilchard fishing between early-1986 and late-1988, this re-ignited tensions between the private and public sectors.

President Fujimori's administration (1990-) adopted decidedly neo-liberal economic policies.⁴¹ A 1990 adjustment programme floated the inti, reduced tariffs and import restrictions, relaxed domestic price controls and removed most constraints over foreign investment.⁴² These measures, in conjunction with the recovery of the pelagic fisheries, encouraged both industrial restructuring and a new export drive. Entrepreneurs invested some US\$400 million in vessel and plant improvements. Between 1991 and 1995, production returned to early-1970s levels.⁴³ As private involvement grew, PESCA PERU's share of anchovy catches fell from 40.7 per cent in 1989 to 28.4 per cent in 1994.⁴⁴ Initially founded in response to a crisis, the company was scheduled for liquidation in 1999.

Peru's new macroeconomic development strategy was complemented by a new regulatory framework and sectoral development programme, courtesy of the General Fisheries Law (LD 25977) of 1994. This confirmed

³⁹ 'Peruvian Fisheries, 1986-7', *Marine Fisheries Review*, vol. 50, no. 2 (1988), p. 63.

⁴⁰ A. García Mesinas 'Current Status and Strategies of Peruvian Fisheries', in M. Murphy (ed.), *Maximum Sustainable Yield from Fish Stocks: A Challenge to Fishermen and Managers*, (Cork, 1993), p. 82.

⁴¹ For an interpretation of neo-liberal economic policies in Latin America, See: V. Bulmer-Thomas (ed.), *The New Economic Model and its Impact on Poverty and Income Distribution in Latin America*, (Basingstoke, 1996).

⁴² J. Sheahan, 'Peru's Return Towards an Open Economy: Macroeconomic Complications and Structural Questions', *World Development*, vol. 22 (1994), pp. 911-2.

⁴³ *WorldFish Report*, (7 Dec. 1995), p. SP/4; *WorldFish Report*, (13 March 1997), p. SP/1.

⁴⁴ Its share of fishmeal and oil production fell from 34.6% to 25.6% and 41.8% to 23.8% respectively over the same period. *Pesca-Peru: Síntesis Estadística*, enero-dic., (Lima, 1994), pp. 1-18.

fish stocks as part of the national heritage (Article 2), and reiterated the state's right to regulate all fishing activities. It not only outlined the principles for managing artisanal fisheries, aquaculture, foreign access, the issue of licences and concessions, and the enforcement of regulations, but also detailed the penalties for noncompliance. Overfishing remains the main concern of policy however, and international bodies have been highly critical of the continued open access status of the fisheries. In 1995 an FAO mission urged the government to introduce charges for fishing rights and fishmeal plant licences, specifying the types and quantities of fish to be processed. It also recommended taxing fishmeal processing so as to direct production towards human consumption. The mission furthermore recommended cutting fleet and processing capacity by 10 per cent and 20 per cent respectively, in order to stabilise the income-generating capacity of the anchovy and other small pelagic fisheries. Additionally, the World Bank has advocated restricting access to these fisheries through the use of ITQs. Although these measures were rejected at the time, the ministry subsequently adopted FAO recommendations regarding tighter controls over fishing, and halted the licensing of new fishmeal plants and vessels.⁴⁵ Further reductions of fishing effort and the introduction of fishing fees are now firmly on the agenda, after pelagic landings collapsed in the wake of the 1997/8 El Niño event, the most recent being an ambitious US \$200 million decommissioning plan which seeks to reduce GRT of the fishmeal fleet by 30 per cent.⁴⁶

Fisheries Development in Chile

With a coastline of some 6,500 kilometres and a 200-mile exclusive economic zone (EEZ), Chile possesses twice as much sea as land. As of 1990, the fisheries sector directly employed about 115,000 persons, utilised capital valued at approximately US\$3.5 billion, and accounted for about one-ninth of export earnings.⁴⁷ Yet it is only since the early 1970s that Chile's fishing industry has made great advances, catches having increased on average by 8–9 per cent per annum between 1970 and the mid-1990s (Figure 2). This growth was stimulated by deregulation, new export incentives introduced by neo-liberal economic policies, and the enhancement of resource endowments through extended territorial jurisdiction. However, open access quickly led to overcapitalisation in both fishing and

⁴⁵ 'Fishing Ban imposed to Protect Stocks', *IMI Environmental News*, (1 Aug. 1995); 'FAO Plan to Cut Peruvian Fishmeal Output', *WorldFish Report*, (26 Sept. 1996), p. SP/3.

⁴⁶ Fish Information Services, Sea-World, 3 May 1999 (<http://www.fis-net.com>).

⁴⁷ P. Pavez, 'Chile's General Law of Fisheries and Aquaculture', in E. A. Loayza (ed.), *Managing Fishery Resources, World Bank Discussion Papers (Fisheries Series)*, no. 217 (1994), p. 59.

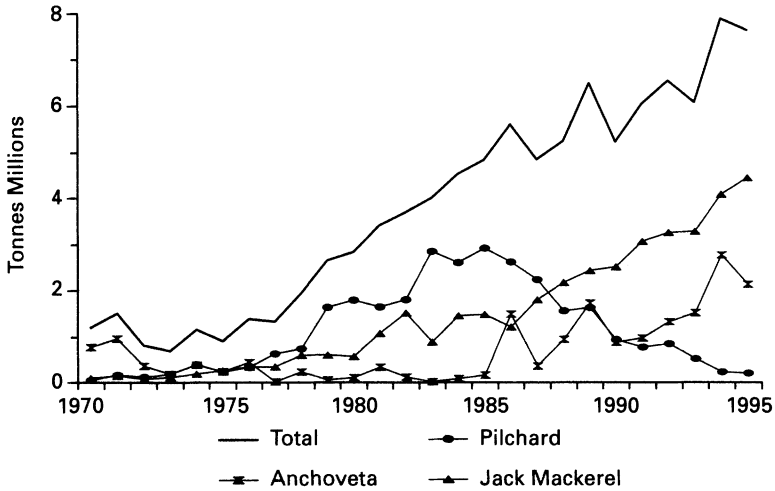


Fig. 2. Chilean Catches 1970-1995. Source: FAO, *Yearbook of Fisheries Statistics* (Rome, annual).

processing sectors, and resources exploited at or beyond their MSY. This, as we document, has led to the approval of new fisheries legislation which seeks to re-regulate the sector.

Although industrial fishing in the North had been very prosperous in the early-1960s, problems arising from the 1964-5 El Niño event prompted the nationalisation of the Northern industrial fisheries.⁴⁸ Prior to the 1973 coup, however, output growth remained modest. This changed as the neo-liberal regime of Augusto Pinochet sought, in common with policies for Chile's other natural resource industries, to develop the sector's export potential. A new quasi-governmental export agency PRO-CHILE, founded in 1974, was entrusted to develop new markets for fisheries products. Furthermore, in line with neo-liberal philosophy, the government also overhauled fisheries management and deregulated the control of resources. Management of the fisheries was delegated to the Subsecretaria de Pesca (SUBPESCA) and the Servicio Nacional de Pesca (SERNAP), founded in 1976 and 1978 respectively. Between 1974 and 1978 the Northern industrial fleet was privatised, and the new owners successfully lobbied to replace the historic permit-based access system with an open access regime. Privatisation also led to industrial concentration. The main beneficiaries were the Anacleto Angelini and the Coloso groups, which utilised profits generated from the fisheries sector to diversify.⁴⁹

⁴⁸ Peña-Torres, 'Political Economy of Fishing Regulation', p. 256.

⁴⁹ Although fishing, consequently, now accounts for only a fraction of the Angelini group's revenue, Aguero and Zuleta suggest that the group controls as much as 70%

Industrial expansion was further encouraged by the 1972–3 El Niño event which, in causing mackerel and pilchard stocks to spawn further southwards, enhanced Chile's fisheries endowment. As additional capital entered the established Northern and emerging Southern fisheries, the number of purse seiners working off the Northern and Talcahuano (Southern) coasts rose by 58 per cent and 75 per cent respectively between 1974 and 1981. These boats were considerably larger and more powerful than the incumbent fleet.⁵⁰ Yet, although catches rose sharply from their early 1970s levels, the composition of the catch also changed since the Northern and Southern anchovy stocks had both effectively collapsed by 1977. In the North, pilchards now predominated, catches reaching 1.6 million tonnes in 1980, jack mackerel landings peaking at 435,000 tonnes the following year. Positions were reversed in the South where jack mackerel catches peaked at just over 400,000 tonnes, compared to pilchard harvests of around 80,000 tonnes in 1980.

The apparently beneficial combination of increased endowments, deregulation, privatisation and industrial concentration quickly encountered limits to growth in the 1980s. Official concern about the status of pelagic stocks led SUBPESCA to introduce a number of ad hoc catch restrictions (restrictions on landing immature fish, closed seasons and TACs). These measures had little effect, as many vessels either simply switched fishing grounds or ignored such edicts.⁵¹ Widespread non-compliance eventually induced a firmer regulatory stance. Decree Law 436, approved in 1986, restricted access to the Northern pelagic fishery by freezing fleet capacity to its 1985 level, although the southern pelagic fishery remained unregulated.⁵² The Law did little to resolve the underlying pressure on pelagic resources however. Consequently, although jack mackerel catches continued to rise, surpassing 3 million tonnes in 1991, pilchard harvests collapsed back to mid-1970s levels. In response, vessels now targeted the previously under-exploited Araucanian

of the country's northern fishing industry, and provides over 40% of the country's fishmeal exports. M. Aguero and A. Zuleta, 'Management Options for Transboundary Stocks: The Peruvian-Chilean Pelagic Fishery', *Managing Fisheries Resources, World Bank Discussion Paper*, no. 217 (1992) p. 72.

⁵⁰ Average hold capacities of the new vessels increased by about 25% in the Talcahuano region, and by 100% in the Northern zone. 'Proceedings of the Expert Consultation to Examine Changes in the Abundance and Species Composition of Neritic Fish Resources', *FAO Fisheries Report*, no. 291, vol. 2, (1983), pp. 255–84.

⁵¹ According to Aguero and Zuleta, the industrial fleet adopted a 'gold rush strategy' when a 1.3 million tonne TAC was introduced to the Northern pilchard fishery, thereby undermining its purpose. Aguero and Zuleta, 'Management Options for Transboundary Stocks', p. 72.

⁵² Peña Torres, 'Political Economy of Fishing Regulation', p.259.

herring stocks. The herring harvest increased from 18,000 tonnes in 1988 to over 560,000 tonnes in 1991, before this fishery also collapsed.

A similar pattern of unregulated growth, punctuated by overfishing and moves to restrict catches, is apparent in Chile's demersal fisheries. Unlike Peru, Chile did not depend entirely upon pelagic landings, demersal fisheries (principally South Pacific and Patagonian hake) generating significant export revenues owing to their higher unit value.⁵³ Although South Pacific hake stocks were already considered close to full exploitation before 1973, encouragement from international agencies saw vessels switch to fishing Patagonian hake. Patagonian hake catches, which were so low as to go unrecorded until the late-1970s, became Chile's most commercially important demersal fishery through the 1980s.⁵⁴

This growth of the fishery was supported by favourable credit facilities extended to export-oriented businesses by the Inter-American Development Bank (IDB) and Chilean Development Corporation (CORFO). Investment was concentrated in processing, while artisanal fishers retained control of harvesting. With buoyant international hake markets, competition between processors ensured high quayside prices that, together with unregulated access to fishing grounds, created an artisanal fishing boom. As Schurman records, additional effort quickly entered the fishery; the artisanal fleet based in Region XI alone growing by 340 per cent between 1979 and 1989, and improved fishing gear was widely deployed.⁵⁵ By 1989, overfishing had led to a decline in Patagonian hake harvests. As competition between processors for supplies intensified, processing margins fell and bankruptcies increased, causing processors to demand government intervention. Growing conflicts with the industrial fleet over access to inshore fishing grounds also led the Artisanal Fisherman's Organisation (CONAPACH) to demand greater regulation of the fishery.

The move towards a comprehensive management system capable of reconciling conservation and economic efficiency began with the proposed

⁵³ In 1990, for example, exports of approximately one million tonnes of pelagic fish products were valued at some US\$400 million, compared to the US\$129 million realised by exports of some 68,000 tonnes of demersal fish products. These figures are indicative – rather than definitive – as the pelagic figures relate to aggregate fishmeal and oil exports, while the demersal data is for frozen and fresh/chilled hake only. FAO, *Fisheries Yearbook: Commodities*, (Rome, 1992), tables G2-1, H2-1, J13-14.

⁵⁴ FAO, *Technical Consultation on the Latin American Hake Industry, Montevideo, 24-8 October 1977*, (Rome, 1978) and FAO *Fisheries Yearbook: Commodities*, (Rome, annual) table J13-14.

⁵⁵ R. Schurman, 'Economic Development and Class Formation in an Extractive Economy: The Fragile Nature of the Chilean Fishing Industry 1973-90', unpubl. PhD diss., (University of Wisconsin), 1993, p. 208; Schurman, 'Snail, Southern Hake and Sustainability', p. 1699.

'Merino Law' in late 1989. Its intention was to introduce ITQs into those fisheries regarded as fully exploited. This provoked conflict between the state and dominant firms in the Northern industrial fisheries, which lobbied vigorously against the scheme.⁵⁶ Doubts over its constitutional validity, along with the transition to democratic rule, prevented its immediate approval. Instead, in September 1991 a compromise agreement, Decree Law 430, was approved following extensive discussions between state and industrial representatives. According to Patricio Pavez, the Under Secretary for Fisheries at the time, the law aimed 'to maintain the fishing effort at a level that assures maximum long-term net social benefit while allowing efficient use of fisheries resources'.⁵⁷ It also detailed Chile's intention to enhance its resource endowments by extending its territorial jurisdiction through the establishment of a 2,000 mile Presential Sea.⁵⁸ More significantly for our purposes, however, by classifying the country's main fisheries as either fully-exploited, in recuperation or emerging, the Law effectively signals the end of open access.⁵⁹ In the case of fisheries designated as either fully-exploited or recuperating, new entrants are precluded and ten year ITQs are to be auctioned off via an extraordinary permit system. Less restrictive rules are applied to emerging fisheries. Artisanal regulations have also been tightened – while artisanal vessels are given exclusive freedom to fish in Chilean territorial waters, prior registration on the *Registro Pesquero Artisanal* becomes obligatory. In instances where a fishery is declared to be fully exploited the *Registro* is closed and quotas are assigned to registered vessels.⁶⁰ However, decree Law 430's failure to curb the growth of fishing effort sees the National Senate seeking, like its Peruvian counterpart, to consider further re-regulation of the industry through the approval of a new Fisheries Law that will establish global and individual catch quotas as the main measure to conserve the fishery.⁶¹ However, recent attempts to introduce such

⁵⁶ See: Peña Torres, 'Political Economy of Fishing Regulation', p. 266–9.

⁵⁷ Pavez, 'Chile's General Law of Fisheries and Aquaculture', p. 62.

⁵⁸ The Presential Sea, would exclude foreign vessels from the high seas jack mackerel fishery. For now Chile is not enforcing this exclusion. See: C. Joyner and P. De Cola, 'Chile's Presential Sea Proposal: Implications for Straddling Stocks and the International Law of Fisheries', *Ocean Development and International Law*, vol. 24 (1993), p. 111.

⁵⁹ Although the Law still recognises open access fisheries, as the term is a residual one – those fisheries not 'fully-exploited', 'recovering' or 'emerging' remain open access – such fisheries must, by definition, be of negligible importance.

⁶⁰ A more comprehensive account of the law is given in: A. Alonso Ibarra et al, 'Neoliberalism and the Latin 'Blue Revolution': Fisheries Development in Chile, Mexico and Peru', *Cemare Research Paper, University of Portsmouth*, no. 139 (1998), table 1.

⁶¹ Juan Cruz, current Fisheries Undersecretary, as reported by Fish Information Services, *Sea-World*, 27 May 1999 (<http://www.fis-net.com>).

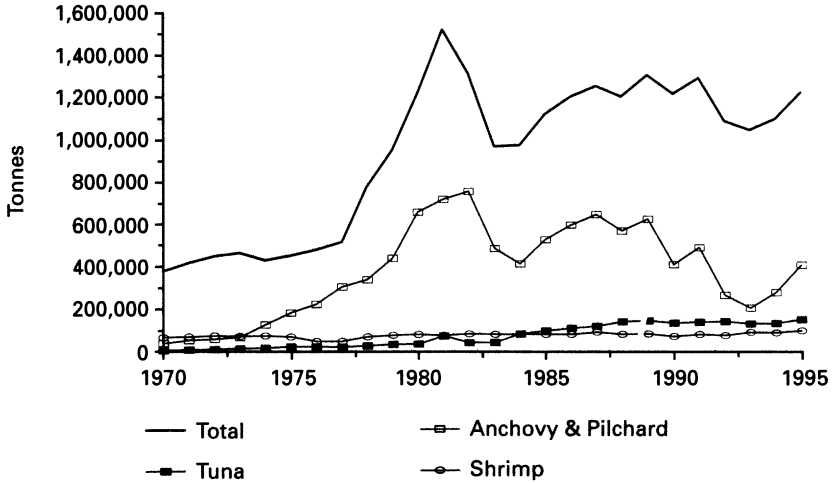


Fig. 3. Mexican Catches 1970-1995. Source: FAO, *Yearbook of Fisheries Statistics* (Rome, annual).

measures were frustrated by an amalgam of artisanal fisherman, fish workers and local environmentalists.⁶²

Mexican fisheries development

There are four significant ways in which Mexican fisheries development differs from that of either Peru or Chile. First, although production increased during the 1970s by some 10 per cent per annum – between the early 1980s and mid-1990s average growth was negligible – unlike in either Peru or Chile (Figure 3). Second, catches are more diverse. Four fisheries – Californian pilchard, Californian anchovy, yellowfin tuna and shrimp – have typically accounted for between one half and two-thirds of the total catch. Third, production is overwhelmingly for consumption, not fishmeal. Finally, co-operatives have played a prominent role in fisheries development. Throughout the 1930s co-operatives were progressively awarded concessions to national fish stocks, a process that culminated with the 1947 Fishing Law granting them exclusive access rights to the nine most important inshore marine and shellfish fisheries.⁶³

⁶² See *World Fishing*, Sept. 1999, p. 3.

⁶³ The 1947 Law granted exclusive rights to harvest shrimp, abalone, lobster, oysters, squid, mullet, octopus and totoaba. The 1972 Federal Law for the Promotion of Fisheries extended the list to include turtles. See: J. L. Soberanes Fernández, 'Historia Contemporánea de la Legislación Pesquera en México', in M. González Oropeza and M. A. Garita Alonso, *El régimen jurídico de la pesca en México*, (México, DF, 1994), p. 9; A. Villa Arce, 'A Review of Recent Changes in Mexico's Fishing Policy', unpubl. Masters diss., University of Delaware, 1996, pp. 4-25.

However, despite these differences, Mexican fisheries have experienced similar problems to those in Peru and Chile, as a result of both the indirect influence of economic policy and direct state intervention.

The first Mexican government fully to explore the sector's economic and social potential was the administration of President Luis Echeverría (1970–6). His government not only established a new statutory framework for fisheries policy, creating a Subsecretaria de Pesca and approving a 1972 Federal Law for the Promotion of Fisheries, but also announced plans to double output to 500,000 tons within that *Sexenio*. While confirming the exclusive fishing rights of the co-operatives, it also encouraged peasants farming in coastal regions to form new fishing co-operatives (*Ejidales de Producción Pesquera*) as security against crop failure. Capital, including loans from the IDB and Bank of Brazil,⁶⁴ was mobilised to increase productivity and employment in the sector, an estimated 6,000 new artisanal vessels entering the fisheries during this period. Marketing and processing were consolidated through PROPEMEX (Productos Pesqueros Mexicanos), a para-statal enterprise created in 1972 to regulate domestic fish prices and develop export markets. Although catches did indeed reach half a million tonnes by 1976, a series of problems materialised. The peso's forced devaluation in August 1976 created debt-servicing problems for PROPEMEX and co-operatives with dollar-denominated debts. Over-fishing in the Pacific shrimp fishery, exchequer losses due to illegal shrimp sales, and incursions into the shrimp fisheries by privateers (*armadores*) masquerading as co-operatives, were also prominent concerns.⁶⁵

These problems were disregarded, however, when the incoming administration of President López Portillo (1976–82) unveiled a new economic strategy based on resource extraction and the development of related industries. Centred on the mobilisation of oil wealth by international borrowing against future revenues, this strategy influenced other sectors, including fisheries. The National Plan for Fishing Development (1977–82) aimed to place Mexico among the world's five leading fish producers, following the declaration of a 200-mile EEZ in accordance with UNCLOS III.⁶⁶ In the short-term, production was to be

⁶⁴ The IADB loan of US\$43 million was to fund the construction of 323 new vessels. The Bank of Brazil's US\$30 million loan was conditional on the purchase of vessels from Brazilian shipyards. *Marine Fisheries Review*, vol. 37, no. 11 (1975), p. 35. Soberanes Fernández, 'Historia Contemporánea', p. 17.

⁶⁵ *Marine Fisheries Review*, vol. 39, no. 12 (1977), p. 31; L. M. Gatti, 'Los Pescadores de México: La Vida en un Lance', *Centro de Investigaciones y Estudios Superiores en Antropología Social, Cuadernos de la Casa Chata 110*, (México D.F., 1986). In the early 1980s illegal shrimp sales were estimated at between 30% and 50% of production and valued at some US\$500 million per annum. "'Shadow Industry' Costs Mexico Millions of Dollars', *Fishing News International*, (Aug. 1984), p. 20.

⁶⁶ The necessary constitutional amendments were approved in July 1976.

increased through licensing agreements, most notably with the US and Cuba. Scheduled to end by the late-1970s,⁶⁷ these agreements delivered a resource income while the Mexicans continued to build up their own fleets.

Decisions to elevate the fisheries *Subsecretaria* to a full Department in 1976, and thence to Ministerial status in 1982, reflected the sector's increasing national importance. The proposed investment budget was doubled to US\$1.3 billion, directed mainly towards building new boats, and Ministers promised the creation of an additional 100,000 jobs in fishing and related industries.⁶⁸ In all, 993 new vessels were planned, with the number of tuna vessels scheduled to increase from 22 to 106 between 1975 and 1982.⁶⁹ As in the oil industry, attracting investment was not a problem. An US\$80 million loan from the IDB supported the creation of a state-directed fisheries bank BANPESCA (Banco Nacional Pesquero y Portuario) in 1980.⁷⁰ BANAPECSA was not only obliged to prioritise co-operative loan requests, but also to underwrite the López Portillo administration's co-operativisation of the privately-owned shrimp armadores.⁷¹ Production remained strongly export-oriented, despite the president's 1975 manifesto commitment to 'guarantee the feeding of the Mexican people and exporting whenever it is possible'.⁷² While poor grain harvests in 1979 and a new food policy (*El Sistema Alimentario Mexicano*) did serve to redirect production towards the home market, domestic fish consumption fell well short of the desired 1982 target of 895,000 tonnes.⁷³

Mexico's late-1970s 'economic miracle' gave way to the 1982 debt crisis

⁶⁷ The agreement with Cuba (July 1976), sought to regulate fishing activity on the Campeche Bank. The US-Mexican agreement (November 1976), provided US vessels with access to specified snapper, grouper and shrimp fisheries within the Mexican EEZ. Enforcement procedures were intensified, and various US vessels were seized for straying into inshore waters. *Marine Fisheries Review*, vol. 41, no. 11 (1979), pp. 38–9.

⁶⁸ Fernando Rafful, Director of the Secretaria de Pesca, *Marine Fisheries Review*, (Dec. 1977), pp. 30–1; F. A. König, *Análisis del crecimiento económico sectorial en México (1940–1987): El caso de la pesca*, (México D.F., 1993).

⁶⁹ *Marine Fisheries Review*, (Dec. 1977), pp. 30–1.

⁷⁰ 'Biggest Fishery Loan Yet: IDB Lends \$80m to Boost Mexican Catch', *Fishing News International*, (Feb. 1981), p. 1.

⁷¹ Pacific coast vessels were transferred to co-operatives in late 1981, Gulf of Mexico trawlers in early 1982. *La Cooperativización*, as the process was known, also permitted PROPEMEX to buy-out private shrimp processors. *Marine Fisheries Review*, vol. 44, no. 11 (1982), p. 29.

⁷² Quoted in the National Plan for Fishing Development 1977–82. In the 1970s, almost two-thirds of the total catch was exported. 'Mexico: A Long Way to Go', *World Fishing*, vol. 30, no. 12 (1981), p. 41.

⁷³ The target was not reached until 1994. *Anuario Estadístico de Pesca 1995*, (México D. F., 1995), p. 135.

as oil prices slumped and export earnings collapsed.⁷⁴ This coincided with a one-third fall in fisheries production between 1981 and 1983 due to the impact of the 1982–3 El Niño event upon Californian pilchard and anchovy stocks, but the problems affecting the high-value export-oriented tuna and shrimp fisheries were more acute.

By 1982, Mexico's tuna fleet rivalled the United States's as the world's largest. However, the fleet's potential greatly exceeded likely catches, one estimate suggesting that it could have harvested the entire catch of tuna taken by the international fleet fishing within Mexico's EEZ between 1977 and 1981 in a single trip.⁷⁵ In the short-term these fears were unrealised. Instead, a United States embargo on Mexican tuna exports following the seizure of US tuna vessels fishing within Mexico's EEZ in 1980,⁷⁶ had widespread sectoral consequences. Initially PROPEMEX canneries offset the embargo by continuing to purchase tuna from state or privately-owned Mexican vessels at prices close to US market prices. While cushioning fishermen, however, it left PROPEMEX with massive inventories. Attempts to reduce these inventories through domestic sales simply caused prices to plummet, saddling PROPEMEX with large operating losses and growing liabilities, and led to the policy being discontinued in late-1981. Thereafter, without PROPEMEX's support, vessel owners were unable to meet their commitments to BANPESCA. Nonetheless, as private investors and BANPESCA both expected the embargo to end quickly, new vessels continued to be commissioned, worsening fleet overcapitalisation.

The failure to develop substantive alternative export markets created problems for the incoming administration of President Miguel de la Madrid (1982–8).⁷⁷ Unless price support was restored, the ensuing bankruptcies throughout the tuna fleet would leave BANPESCA holding an estimated US\$1 billion in nonperforming loans. Consequently, the administration capitulated and restored the subsidies, almost one-third of the fleet receiving direct government support for not fishing by 1985.⁷⁸ Although the US embargo was lifted in 1986, tuna production quickly

⁷⁴ M. D. Ramirez, *Mexico's Economic Crisis: Its Origins and Consequences*, (New York, 1988); World Bank, *A Decade after the Debt Crisis*, (Washington, 1993).

⁷⁵ *Marine Fisheries Review*, vol. 44, no. 8 (1982), p. 28.

⁷⁶ The embargo, which remained in place until 1986, cost Mexico an estimated \$50 million. 'US Tuna Embargo Costs Mexicans \$50 Million', *Fishing News International*, (June, 1983), p. 30.

⁷⁷ In 1978, 68.3% of the 26,337 tonnes landed was exported to the United States. By 1985, 58.8% of the tuna catch was consigned to domestic markets. *Marine Fisheries Review*, vol. 48, no. 4 (1986), p. 82.

⁷⁸ *Marine Fisheries Review*, vol. 44, no. 8 (1982), p. 29; *Marine Fisheries Review*, vol. 48, no. 4 (1986), p. 82; 'Mexico's Tuna Ship Gamble', *Fishing News International*, (July 1982), p. 71.

exceeding 100,000 tonnes (1987), the United States newly embargoed Mexican tuna exports after the Mexican fleet refused to adopt measures to reduce dolphin by-catches in order to comply with the US Marine Mammals Protection Act.⁷⁹

By the late-1970s, excessive reliance on US markets, and growing overcapitalisation, had also led to a crisis for the shrimp co-operatives. Declining US prices led PROPEMEX's US marketing subsidiaries Ocean Garden and Ocean Crest to increase inventories.⁸⁰ By 1981, this policy had created substantial liquidity problems for PROPEMEX, who responded by delaying payment to its co-operative suppliers. Faced with a shortage of working capital and no immediate prospect of payment from PROPEMEX, many co-operatives illegally sold their catches at sea or to shore-based intermediaries at low prices.⁸¹ Combined with overcapacity, this served to increase operating losses, estimated to be as high as US\$30,000 per trawler.⁸² Pressure from the politically powerful co-operatives wrung concessions from the de la Madrid administration, including working capital from BANPESCA and an investment programme to modernise the Pacific shrimp fleet. Northern co-operatives were also permitted access to foreign exchange for fleet repairs. These concessions were offset by a combination of higher domestic interest rates and a 50 per cent devaluation of the peso, which raised the costs of debt-servicing, whether dollar or peso-denominated. It created problems particularly for those shrimp co-operatives that had paid premium prices in acquiring privateers during the earlier co-operativisation process.⁸³ Growing cooperative indebtedness was an integral factor behind the formulation of a new Federal Fishing Law in 1986. This law aimed to both stimulate and regulate fisheries production so as to increase societal welfare. In practice it meant strengthening co-operative access rights through concessions and permits, while granting co-operatives exclusive rights in mariculture.⁸⁴

⁷⁹ In July 1997 a reduction in incidental dolphin by-catch fleet to acceptable levels, led the United States to partially lift the embargo. It was finally rescinded in May 1999. R. L. McLoughlin, 'UNCLOS and the Demise of the United States' Use of Trade Sanctions to Protect Dolphins, Sea Turtles, Whales, and Other International Marine Living Resources', *Ecology Law Quarterly*, vol. 21, no. 1 (1994), pp. 1-78; *Semarnap Press Release*, (1 Aug. 1997).

⁸⁰ This decline was demand-induced, the economic recession in the United States and high interest rates reducing consumer demand. *Marine Fisheries Review*, vol. 43, no. 9 (1981), p. 26. ⁸¹ *Fishing News International*, 'Shadow Industry', p. 20.

⁸² M. C. Rodríguez de la Cruz, *Aspectos Socioeconómicos de la Pesquería y el Cultivo de Camarones en México*, (Rome, 1987), p. 50.

⁸³ M. Miller, 'Shrimp Aquaculture in Mexico', *Food Research Institute Studies*, vol. 22, no. 1 (1990), pp. 83-107; Vásquez León and McGuire, 'La Iniciativa Privada', p. 60.

⁸⁴ The Law allowed co-operatives to invest in joint ventures, becoming partners with *ejidos* and non-fishing co-operatives. The formation of new co-operatives was also

Although the de la Madrid administration presided over a period of renewed fisheries growth, catches increasing by one-third between 1983 and 1987, the strategy had a high fiscal cost. PROPEMEX, in particular, accumulated huge debts.⁸⁵ Faced with these circumstances, President Salinas de Gortari's administration (1988–94) took swift action to restructure the sector in line with its overall neo-liberal development strategy and the need to curb the fiscal deficit. This included privatisation to encourage inward investment. The fisheries sector was not immune. The privatisation of PROPEMEX canneries, processing factories and vessels began in 1988. Financial deregulation and denationalisation of the retail banking sector provided an opportunity for restructuring credit provision to the sector. BANPESCA was closed and the Foreign Trade Bank (Banco Mexicano de Comercio Exterior) was empowered to support export-oriented fisheries. PRONASOL funds were made available for the development of domestic fisheries.⁸⁶

As Villa Arce notes, the objective of the 1990–94 National Programme for the Development of Fisheries and its Resources was to achieve a more efficient use of fisheries resources and infrastructure.⁸⁷ The already seriously indebted co-operatives were perceived as one source of inefficiency. Reduced state support ensured that several co-operatives collapsed.⁸⁸ More seriously, their exclusive access to key commercially important species was seen to seriously distort the conduct of the sector, a point evident in the lobbying by CANAINPES – the National Chamber for the Fishing Industry – for equal access to resources. Annulment of Article 27 of the Constitution in 1992 permitting the privatisation of *ejido* land, anticipated the removal of the fishing co-operatives' historic exclusive harvesting rights in 1992's Fishing Law. The cooperative's

permitted. However, as Nadel Egea suggests, the process was excessively bureaucratic. A. Nadel Egea, 'The Development of Mexico's Living Marine Resources', in S. Díaz-Briquets and S. Wintraub (ed.), *Regional and Sectoral Developments in Mexico as Alternatives to Migration*, (Boulder, 1991), p. 233ff.

⁸⁵ By 1987, PROPEMEX's debts amounted to about 12.7 trillion Mexican pesos (approximately US\$6.4 billion) F. Estrada y Servin, 'Intervención del Director General de Productos Pesqueros Mexicanos Sa de CV', in Secretaría de Pesca, *Reunión de Autoevaluación 1983–1987*, (México DF, 1988), pp. 29–36.

⁸⁶ PRONASOL (Programa Nacional de Solidaridad) was conceived in 1989 to help alleviate poverty. See: H. Pánuco-Laguette and M. Szekely, 'Income Distribution and Poverty in Mexico', in Bulmer-Thomas (ed.), *The New Economic Model in Latin America*, pp. 202–10.

⁸⁷ Villa Arce, 'Recent Changes in Mexico's Fishing Policy', p. 44.

⁸⁸ The 94 co-operatives selected to participate in the Pacific shrimp cooperative 1992 rescue plan (*Programa de Reestructuración Financiera de Cooperativas Camaroneras del Litoral del Pacífico*) had debts totalling 264.7 million pesos. *1995–2000 Programa de Pesca y Acuicultura* (Mexico, DF, 1996), p. 40.

historic preferential access rights were replaced by a system of permits and concessions designed to serve the 'public interest' (Article 7).

The immediate result of these changes are shown in Vázquez León and McGuire's study of the Sonoran shrimp fishery.⁸⁹ They identify a new class of banker-owners (*armadores-banqueros*), who quickly came to dominate the local shrimp fishery through the purchase of antiquated co-operative vessels at rock-bottom prices. While efficiency undoubtedly improved as these new owners transferred the catch permits so acquired to more modern vessels, it not only ensured the dissipation of the social benefits associated with the co-operatives but also exacerbated pressures on marine shrimp stocks.

Over-fishing is a key preoccupation of President Zedillo administration's (1994–2000) approach to fisheries management. Its principal policy document, the 1995–2000 Fisheries and Aquaculture Programme, emphasizes the need to 'halt the tendency towards environmental deterioration', to 'reverse the process of over-exploitation of resources', and to 'promote responsible fishing practices in accord with resource availability'.⁹⁰ Yet whether it will be any more successful than its predecessors remains to be seen.

Conclusion

Fisheries development in the major Latin American fish producing nations has parallels with agrarian colonisation programmes. In the case of fisheries, the belated recognition of an unexploited oceanic frontier offered the opportunity to re-inforce the historically dominant pattern of primary product export-based growth. The extension of this frontier, together with the received fisheries wisdom regarding the plenteous nature of stocks,⁹¹ ensured few obstacles were evident in the 'race to fish'. Despite this, at the national level, heterodox fisheries development programmes were clearly in evidence.

In Chile, the macroeconomic faith in the market mechanism was replicated at the fisheries level. Historic permit-based access restrictions were removed, and incentives and marketing support were introduced to encourage exports. Although the Northern industrial fleet was privatised, crucially, rights to the underlying resource were not. Consequently, a rapid escalation in fishing effort in both the principal pelagic and demersal

⁸⁹ Vázquez León and McGuire, 'La Iniciativa Privada', p. 60ff.

⁹⁰ *Programa de Pesca y Acuicultura 1995–2000*, pp. 10, 14, 47.

⁹¹ Christy, 'The Development and Management of Marine Fisheries', p. 27, for example, notes that Inter-American Development Bank policy guidelines at the time presumed fisheries resources to be both abundant and untapped (Peruvian anchovy excepted).

fisheries quickly encountered limits to growth. Early attempts to curb overfishing through the declaration of a series of ad hoc catch restrictions in the pelagic fisheries met with little success and so, faced with the prospect of a series of stock collapses, the government moved to re-regulate the sector, approving a new fisheries law in late 1991.

In contrast, while Mexican fisheries policy also faithfully reflected national developmental priorities, here the management emphasis has been somewhat different. Preferential treatment accorded to collectivist organisations in the agrarian field was matched in the fisheries sector. *Ejidales de Producción Pesquera* not only received exclusive access rights to the most important inshore marine and shellfish fisheries, but also benefitted from government investment and support programmes, and were accorded priority when requesting loans from BANPESCA. The development of the tuna fishery more closely resembled the Chilean experience however. Open access prevailed, soft credits were offered and overcapitalisation quickly resulted. Unlike in Chile though, the Mexican state chose to intervene and subsidise the tuna fleet. The subsequent reformulation of Mexican fisheries legislation in the 1990s, (in contrast to the Chilean counterpart), had rather less to do with restraining overfishing and rather more to do with neo-liberal doctrine, which assumed that historically restrictive (cooperative) access rights inhibit efficiency improvements in the sector.

Although Peru had already begun to exploit its oceanic frontier prior to the 1970s, the radical military government of General Velasco Alvarado encountered little opposition when it nationalised the anchovy fishery, following its well-documented collapse in May 1973. Thereafter the state faced the unenviable problem of reconciling populist pressures for increased worker participation with the need to rationalise a highly overcapitalised fishery. Management difficulties were compounded as, over time, private enterprise also began to demand an increased involvement in the sector. The reformulation of Peruvian fisheries policy in the 1990s along Chilean lines temporarily resolved these problems; privatisation eliminated the state's residual involvement in production, the Peruvian EEZ became a wholly open access fishery for domestic private fishing capital, while the state re-affirmed its right to regulate all fishing activities.

The new regulatory frameworks governing the fisheries of Chile, Mexico and Peru have two fundamental principles in common. First, in each case, the state has acted to clearly define its role in the management of the national fisheries. Recognition that resources are not infinite has prompted the state to develop supervisory mechanisms which have the potential to reduce overfishing by restricting both artisanal and industrial

fishing. Second, an institutional consensus appears to be emerging regarding the most appropriate policy instruments to be used. Although Mexico continues to operate a system of transferable permits/concessions to control entry to the fishery, both Chile and Peru are evolving more complex management strategies based on TACs and ITQs. Nevertheless, while these strategies address the dilemmas of overfishing and overcapitalisation and offer the state an opportunity to recoup revenues from the sale of fisheries resource rights, there remain questions as to both their appropriateness and effectiveness in the Latin American context. Why may their appropriateness be doubted? While ITQs raise sectoral efficiency, the clear economies of scale involved in fish harvesting ensures that the labour-intensive small-scale fisheries sector will be adversely affected – with consequent equity implications. Why may their effectiveness be doubted? Neoliberal policies, in association with such scale tendencies, have resulted in industrial concentration, creating a small number of extremely powerful industrial stakeholders who have successfully, to date, prevented the application of ITQs within the major national fisheries. Consequently, it is perhaps a little premature to conclude that Latin American fisheries management is presently capable of dealing satisfactorily with the overcapitalisation/overfishing dichotomy.