Bailey, C., A. Dwiponggo and F. Marahudin
1987 *Indonesian Marine Capture Fisheries*. ICLARM Studies and Reviews 10. Manila: International Center for Living Aquatic Resources Management/Jakarta: Directorate General of Fisheries and Marine Fisheries Research Institute, Ministry of Agriculture.

Bailey, C. and C. Zerner
1992 Community-Based Fisheries Management Institutions in Indonesia. *MAST* 5(1):1-18.

Berkes, F., D. Feeny, B.J. McCay and J.M. Acheson
1989 The Benefits of the Commons. *Nature* 340:91-93.

Collier, W.L., H. Hadikoesworo and M. Malingreau
1979 Economic Development and Shared Poverty among Javanese Sea Fishermen. In: A.R. Librero and William L. Collier (Eds.), *Economics of Aquaculture. Sea-Fishing and Coastal Resource Use in Asia*. Proceedings of the Second Biennial Meeting of the Agricultural Economics Society of Southeast Asia, Nov. 3-6, 1977. Manila: Agricultural Development Council, Philippines Council for Agriculture and Resource Research.

Emmerson, D.K.
1982 Orders of Meaning: Understanding Political Change in a Fishing Community in Indonesia (1975). In: B. Anderson and A. Kahin (Eds.), *Interpreting Indonesian Politics: Thirteen Contributions to the Debate*. Interim Reports Series, Publication No. 62. Ithaca, NY: Cornell Modern Indonesia Project.

Hardin, G.
1968 The Tragedy of the Commons. *Science* 162:1243-48.

Kolff, G.H. van der
1936 The Historical Development of the Labour Relationships in a Remote Corner of Java as They Apply to the Cultivation of Rice: Provisional Results of Local Investigations. The Netherlands: National Council for the Netherlands and the Netherlands Indies of the Institute of Pacific Relations.

Polunin, N.V.C.
1983 The Marine Resources of Indonesia. *Oceanography and Marine Biology: An Annual Review* 21:455-531. Aberdeen University Press.
1984 Do Traditional Marine 'Reserves' Conserve: A View of the Indonesian and New Guinean Evidence. In: K. Ruddle and T. Akimichi (Eds.), *Maritime Institutions in the Western Pacific*. Senri Ethnological Studies No. 17. Osaka, Japan: National Museum of Ethnology.

Ruddle, K.
in press *A Guide to the Literature on Traditional Fishery Management Systems of the Asian and Pacific Tropics*. FAO Technical Paper. Rome: FAO.

Sya'rani, L. and N.G. Willoughby
1985 The Traditional Management of Marine Resources in Indonesia, with Particular Reference to Central Java. In: K. Ruddle and R.E. Johannes (Eds.), *The Traditional Knowledge and Management of Coastal Systems in Asia and the Pacific*. Jakarta: UNESCO.

Zerner, C.
1990 Marine Tenure in Indonesia's Makassar Strait: The Mandar Raft Fishery. Paper presented at the first annual meeting of the International Association for the Study of Common Property, Duke University, Durham, North Carolina, September 1990.
1991 Sharing the Catch in Mandar: Changes in an Indonesian Raft Fishery (1970-1989). In: J.J. Poggie and R.B. Pollnac (Eds.), *Small Scale Fishery Development: Sociocultural Perspectives*. ICMRD: University of Rhode Island.

La iniciativa privada in the Mexican Shrimp Industry

Politics of Efficiency

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ABSTRACT Under the guise of structural adjustments in the Mexican economy, the offshore shrimp industry in the Gulf of California has recently changed ownership, from cooperatives to private entrepreneurs. This paper examines the subsequent efforts by the coalition of private owners to effect a redistribution of resources from the inshore small-boat sector, still largely organized in cooperatives, to the offshore sector, and to enlist the aid of the government in buttressing the private sector's newfound 'comparative advantage.'

Introduction

Within the last several years, Mexico's shrimp resources, historically reserved for state-licensed cooperatives, have been partially 'privatized.' Since 1992 entrepreneurs have been officially permitted, indeed encouraged, to purchase and use the boats and equipment of debt-ridden cooperatives. The public-sector fisheries bank has ceased operations. Regional federations of cooperatives have been disenfranchised. The parastatal packing and marketing company is in the process of loosing its monopsonic control over the export of Mexican shrimp. Federal agencies charged with the management of this industry are, it appears, increasingly responsive to the wishes of the private sector. In short, the shrimp industry, like much of Mexico's economy, is undergoing a period of rapid 'structural adjustment.'

Mexico precipitated the global demand for adjustment by announcing, in 1982, that it had exhausted its foreign-exchange reserves and could no longer pay the interest on its massive debt, incurred during the oil boom of the late 1970s. The initial response was a brief period of severe fiscal austerity, felt primarily in the form of wage controls, followed by an accession to the 'Brady Plan,' promulgated by the U.S. Secretary of the Treasury in 1985. The plan conditioned continued international lending on 'a series of measures designed to foster economic growth, such as encouraging foreign investment, selling inefficient public-sector enterprises, reducing import protection, and liberalizing capital markets' (Weintraub 1990:142-43).

President Salinas de Gortari embraced the philosophy of the Brady Plan when he took office in December, 1988. To enhance agricultural efficiency, competitiveness, and private investment, Salinas has rescinded Article 27 of the Constitution of 1917 – the historic charter for *agrarismo* in Mexico – and removed much of the elaborate structure of agricultural subsidies and consumer price supports (Hewitt de Alcántara 1992). To promote economic growth through trade liberalization, he has negotiated the North American Free Trade Agreement (Nader *et al.* 1993). To foster business confidence and encourage the repatriation of capital, he has reprivatized the banking sector, offered up for sale much of the state-owned commercial and industrial plants of Mexico, dismantled the byzantine regulatory apparatus which had been the hallmark of the Mexican state, devalued and stabilized the national currency, and curbed, to a degree, inflation (Lustig 1992). And to assuage the distributional consequences of these reforms, he has promulgated the *Programa Nacional de Solidaridad*, a pot of financial infusions to the impoverished and dispossessed (Salinas de Gortari 1992).

In the rhetoric surrounding structural adjustment, 'efficiency' has come to be synonymous with privatization. Here we attempt to unpack this linkage by examining how reform plays itself out in one locale – Guaymas, Sonora – and on one commodity – tropical shrimp. Our central claims are that, in the middle reaches of the Gulf of California, the 'private initiative' has been a government-sponsored move to attract capital into an overcapitalized sector of the shrimp industry, has largely succeeded in defining, and destroying, common notions of efficiency in the exploitation of natural resources, and has resorted to government regulation for its own survival.

We begin by tracing the process of privatization in the offshore sector of the Mexican shrimp fishery over the last decade or so. We then assess the claims of 'efficiency' made on behalf of the offshore sector vis-à-vis the inshore sector. Finally, we examine the recent regulatory changes in the fishery and the role of the private sector in promulgating those changes.

The Process of Privatization

Shrimp trawler fleets throughout the Gulf and Pacific littoral grew markedly in the 1970s, despite warnings as early as 1971 of '*una posible crisis*' of overcapacity and diminished yields (Chávez and Lluch 1971:141). Efforts were made in the early 1980s to curtail this expansion and return the fleet to cooperative ownership after a period of private investment in the 1970s, but the capacity was still in excess of economically profitable numbers. One study estimated an annual loss per trawler of US$30,000 (Rodríguez de la Cruz 1987:50). This loss compounded a debt problem for most cooperatives dating to the 1982 transition, when coops were required to purchase their equipment and boats from private owners, often at

inflated costs (Miller 1991). By the end of the decade, the economic crisis in the industry came to a head: cooperatives were on the verge of bankruptcy, the state-controlled *BanPesca*, which had been providing loans at relatively benign interest rates, was closed down, and, as indicated by a sharp decline in catch, it appears that the shrimp stock itself collapsed.[1]

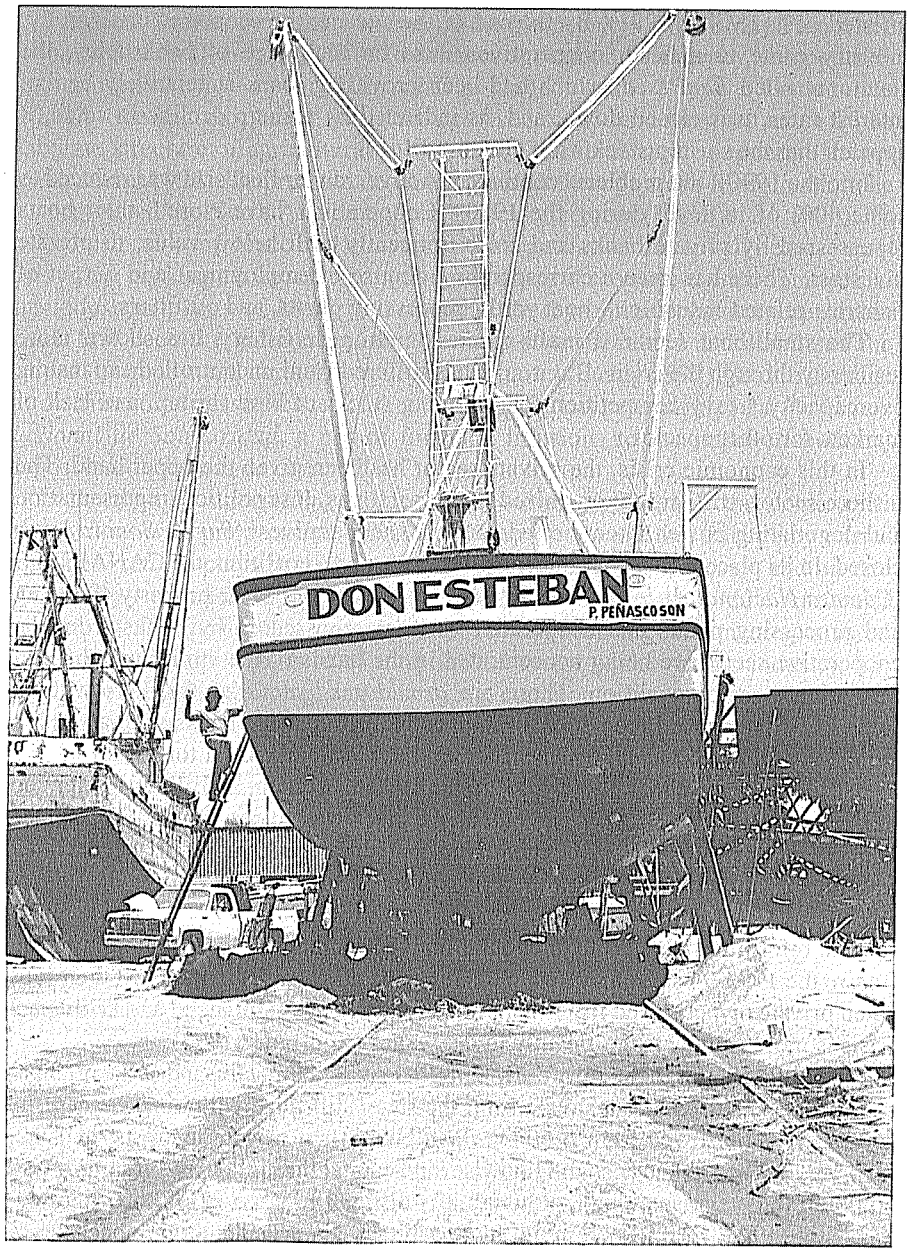
Into the 1990s, the problems continued. Active trawler fleet size was reduced to some 40% of its level during the 1980s. Cooperatives have closed, their boats repossessed by private banks and sold, frequently well below value, to private investors. There has been a corresponding demise in employment and output of fisheries-related industries – boat yards, processing plants, and outfitters.

The small-boat sector, a multi-species, multi-gear fishery, has shown more resiliency through the crisis. But it, too, has suffered from uncontrolled expansion, overcapacity, heavy competition for declining stocks of blue shrimp, and lack of markets for other species.

In this economic crisis, the private sector has been given the upper hand. The inshore sector, still largely organized in cooperatives, lost political representation and negotiating power when the federation of cooperatives, '*Sur de Sonora*,' was closed. In its place, private producers quickly formed a coalition, the CANAINPES (*Cámara Nacional de la Industria Pesquera*). Boats and other property (freezing and processing plants and cooperative offices) repossessed by banks from the cooperative sector are being concentrated in the hands of the strong members of this private sector coalition. These are *armadores-banqueros* (banker-owners), some of whom control the administrative councils of private banks such as *Banco del Atlantico* and *Bancomer*. Others are ex-bank officials. Of a total fleet of 279 boats from Guaymas that participated in the 1992-93 season, 205 already belonged to the private sector. Ninety percent of the fleet was under private flag by the 1993-94 season. Of the 25 cooperatives that are registered, 21 have declared bankruptcy and most of their property has been embargoed (*El Imparcial*, June 4, 1993).

The reform has also brought about a marked increase in local unemployment. Before the 1993-94 season started, 600 Guaymas offshore fishermen lost their jobs when private owners hired fishermen from areas where the financial and ecological crisis is more acute, at significantly lower wages (Rodríguez 1993).

The bitter ironies to the story are manifold. Private capital expanded the offshore fleet in the 1970s. Under mandate from the state, still flush with oil revenues, the cooperatives borrowed from *BanPesca* and bought out private interests. In 1982, oil prices collapsed, the peso did likewise, and capital throughout the country – and no doubt in Guaymas as well, although it is difficult to trace – fled abroad, often, as Lustig (1992:94) notes, earning 'huge capital gains.' The emerging package of structural adjustments which developed in the wake of the debt crisis was keyed to the repatriation of this capital. First, internal interest rates were allowed to rise through the 1980s 'to very high levels intended to offset inflation and reduce



In Puerto Peñasco, up the coast of Sonora, the lone shipyard that was in operation during the disastrous 1992-1993 shrimp season had but a single job: refurbishing a repossessed trawler for a private owner, the same boat he had sold to the cooperative a decade earlier.

incentives for further capital flight (Hewitt de Alcántara 1992:9). Then in 1990, not coincidentally, the Mexican banking system was reprivatized – 'one of the most significant moves to restore business confidence and the goodwill of the financial community in Mexico and abroad' (Lustig 1992:107) – and the fisheries law reserving shrimp for cooperatives was rescinded.

By then, inevitably, the offshore cooperative sector was deeply in debt, deeply fractionated, and vulnerable – a fire-sale opportunity for private investors. For the most part, by 1992, its assets were in the hands of the *armadores-banqueros*. In Guaymas, the quest of the private sector for 'efficiency' has now begun, and it is moving resolutely inshore.

Pangas and *Barcos*: Comparative Efficiencies

Since Mexico's economic policy is ostensibly predicated on stimulating private investment in productive endeavors, we ask here whether the acquisition of the offshore fleet by bankers and entrepreneurs is a wise business decision. We address the question through a comparative evaluation of the costs of capturing shrimp in the offshore *barco* sector and the inshore *panga* (small-boat) sector. We conclude that the offshore sector is disadvantaged, and the subsequent section will examine the efforts by the private sector and the state to overturn this comparative disadvantage.

To estimate the efficiency of harvesting shrimp, we measure production costs and compare them to revenues in recent seasons. For each sector we determine a breakeven point in which costs of production equal benefits – a minimum necessary production level at a specified ex-vessel price in which all production costs will be covered, but with zero economic profits. If production is at or below the breakeven point, we consider the enterprise to be economically inefficient, and thus, modifications must be made by some combination of lowering costs of production, reducing fleet size, and increasing catch per boat.

For a shrimp trawler we estimate that the breakeven point is a total of 12.2 metric tons (mt) of shrimp per season at an average price of US$9.70 per kg. However, during the past five seasons, production per trawler has been consistently below this limit, at an average of 7.6 mt. For the 1991-1992 season production records indicate an average of 6.04 mt per boat. During this season the average number of trips made per trawler was lower than the usual, 4.3 instead of 6 trips (CRIP 1992). Adjusting for this change, we calculate that while average total benefits per trip amounted to $13,624, average total costs amounted to $21,327. This gives an average net loss of $7,703 per trip.

In the case of the inshore sector in Guaymas, we estimate that a *panga* needs to produce 10.66 kg per day at an average price of $10.69 per kg in order to cover costs of production. This calculation is based on the assumption that a fisherman

will go out an average of 30 days during the two-month season, missing a number of days as a result of weather conditions and tidal patterns. When fishermen go out fewer days, costs of production per day increase proportionally since equipment costs are concentrated into these fewer number of days. This was the case in the 1992-93 season in which fishermen went out for an unusually low average of only 11.1 days, partly as a result of added political pressure from the private sector, as we will review below. In this case, the breakeven point increased to a minimum production of 17.81 kg per *panga* per day. Daily records per *panga* of the 1992-93 season for an inshore Guaymas cooperative indicate an average production of 23.7 kg. Average total benefits per day per *panga* amounted to $253.35, while total costs averaged $190.48. This gives an average net benefit of $62.87. These cost/benefit calculations leave no doubt as to the comparative harvesting efficiency of the small-scale sector of the shrimp fishery in Guaymas (see Appendix). The results are even more impressive when we realize that the 1992-93 season was considered to be below average by inshore producers.

Another factor that must be taken into account when comparing the economic efficiency of the two sectors is the species of shrimp being captured. As indicated by the difference in the price per kilogram of shrimp for each sector used in the above calculations, the average price tends to be higher for the inshore sector than for the offshore sector. This reflects a difference in quality of shrimp as well as in species composition. While 80% to 90% of the shrimp harvested by the inshore sector are blue shrimp (*Penaeus stylirostris*), the offshore sector produces a much greater proportion of brown (*P. californiensis*) than blue shrimp. This is significant in that the export market price for blue shrimp is about 20-25 cents per lb higher than the price for brown shrimp. In terms of the overall industry, according to the Sonoran state manager of the parastatal marketing firm, Ocean Garden, 40-50% of the blue shrimp produced for export in the Pacific comes from the inshore sector. While the offshore sector has been significant in increasing the volume of brown shrimp for export, a species found at greater depths (35-40 fathoms), it has not done the same for blue shrimp, which tend to be found at relatively shallow depths (2-18 fathoms), migrating offshore from estuaries and bays.

The inshore sector, then, not only produces a significant volume of the most valuable shrimp species for export, but, as our calculations of economic efficiency indicate, it does so at much lower costs of production. The inshore sector is clearly at an economic advantage in the competition for blue shrimp. In response, the offshore sector is pursuing survival strategies that seek to alter the distribution of resources in the Gulf of California.

Management, the Private Sector, and the Redistribution of Resources

In a climate of deregulation and reduced bureaucracy, the Mexican government nevertheless continues to play a central role in the shrimp fishery through a highly centralized management organization. From its offices in Mexico City, the Fisheries Ministry (*Secretaría de Pesca* or *SePesca*) directs all matters concerning research, law, and regulatory enforcement through regional administrative and research centers. Managers have embarked on a campaign of redistributing gains from the inshore sector to the newly privatized offshore sector. Through this process, the private sector has been able to test the degree of power it has acquired under the current government. The cooperative or social sector, on the other hand, after loosing political representation as a result of the disintegration of cooperatives and the regional federation, is increasingly becoming aware of a loss in the power of negotiation formerly present vis-à-vis local fishery administrators. Finally, local level fishery administrators are loosing their flexibility to deal with specific social and economic issues. Instead, they are having to yield to private sector demands.

The examination of recent regulations, the change in enforcement, and the current intervention of the private sector in matters of management illustrate these points. We will begin by looking at two basic regulations and how enforcement of these regulations has recently changed.

Areas of Legal Exploitation

Guaymas inshore fishermen, by law, must limit their operations to the Guaymas-Empalme bay, and must share this territory with fishermen from the nearby Empalme cooperative as well as unaffiliated fishermen who obtain a permit from *SePesca*. The bay, however, is considered by fishermen to be polluted and too small to support the population involved in shrimp fishing. Local estuaries, on the other hand, are considered by fishermen to be inappropriate exploitation areas in terms of resource conservation – while larvae and juvenile shrimp can be found in estuaries, adult shrimp migrate to the bay where they achieve an optimal marketable size. Conflicts over this issue between Guaymas fishermen and Empalme residents who shrimp in the estuary for subsistence have been commonplace.

In the past, local administrators from *SePesca* bent the law as a result of pressure from inshore cooperatives. They allowed fishermen to shrimp outside the bay, in what are considered offshore waters. This was a local arrangement, without approval from Mexico City officials, and served to placate the cooperatives.

However, this arrangement has become increasingly problematic. During the past 4 years, visits of *SePesca* inspectors from Mexico City have become more frequent and occur during the best tides at the beginning of the season, when fishermen hope to catch perhaps 1/3 of what they will catch throughout the entire season. During these official visits, fishermen must suspend offshore fishing so as not to expose the arrangement and jeopardize their relationship with local authorities.

The cost to inshore fishermen is substantial. Not only are their overall catches reduced, but they loose access to market-optimal sizes of shrimp.

The conflict between local arrangements and centralized rules escalated during the 1992-93 season when the private sector, through the CANAINPES, issued a formal complaint to fishery officials calling attention to the illegality of inshore fishermen shrimping offshore. The complaint not only targeted Guaymas fishermen, but all inshore fishermen along the southern coast of Sonora. After loosing several good tides, fishermen decided to go out, maintaining that the bays had to be cleaned up before they could fish inshore for an entire season. In defiance, wives accompanied their husbands to reduce the possibility of violence. At least for one more season, the local arrangement was allowed to prevail, albeit through civil disobedience rather than informal negotiation.

The Veda

During the summer months shrimp fishing is strictly prohibited. The closing and opening of the season is determined by the National Fisheries Institute after reviewing proposals sent by scientist from the different regional research centers. Scientists establish the closure based on studies of gonadal maturation, and the dates during which such studies are carried out as well as the expediency with which the decision to close the season is taken are crucial factors in the conservation of the resource.

Decisions for opening and closing the season, however, get entangled in the bureaucracy. This leads to delays in the opening of the season, which greatly affect inshore fishermen, and to delays in the closure of the season, which benefit the offshore sector in the short run but hurt the fishery in the long run.

While for the past three or four years the inshore season has opened at the beginning of September, fishermen claim that the best time for fishing in the bay are the last two weeks of August. But by the time the season actually opens in September, most of the shrimp have already migrated offshore. Offshore fishermen, on the other hand, complain that the season closes too late. According to field observations during the 1992-93 season, studies of gonadal maturation started when approximately 25% of females were already gravid. By the time the season was officially closed, the percentage of gravid females had doubled.

Private sector intervention during the 1992-93 season was evident. In contradiction to local biologists' recommendations, and as a result of political pressure from the private sector, the offshore season opened two weeks earlier than usual; the established practice had been to open the offshore season one month after the inshore season.

New Regulations

In May, 1991, new regulations were issued by the Fisheries Ministry regarding the two sectors involved in the fishery (*Secretaría de Pesca* 1991). These laws directly

limit the inshore sector's fishing capacity. Outboard motors above 55 hp can be used only if they had been bought and registered with the *Delegación Federal de Pesca* before May 18, 1991. The only authorized nets are the cast net and the *suripera*.[2] The *chinchorro de línea*, an efficient and selective gillnet, has been outlawed. Inshore shrimp fishermen can only fish between 0-5 fathoms. The motor can only be used as transportation to and from the fishing area.

The official goal of the above regulations is the conservation of the resource: the inshore sector is believed to be overexploiting shrimp stocks, as indicated by a decline in productivity, and thus effort must be limited. However, there are several contradictions inherent in these new regulations for which no specific and well-founded rationale has been provided.

Both the *suripera* and the cast net are less efficient and selective than the *chinchorro*, and for the *suripera* net to function, current and prevailing wind conditions in the Guaymas area require the use of the engine at all times. The argument behind the banning of the *chinchorro* is that it encourages illegal fishing by non-cooperative members, since it is relatively easy to use. However, fishermen perceive that this problem has more to do with a deficiency in management and enforcement than with the net itself.

Since the law prohibiting the *chinchorro* was issued, arrangements were made between local fisheries officials and small-scale fishermen similar to those regarding shrimping outside of the bay. The regulation was observed in the breach, until inspectors from Mexico City arrived. In general, local managers familiar with the situation see the new regulation as a political maneuver. However, the arrangement is being jeopardized by new accusations against the *chinchorro* coming from the CANAINPES, mainly that its thin nylon thread cuts and kills the shrimp. Without any empirical foundation as to the veracity of their claim, they argue that true enforcement is crucial for the protection of the resource (*El Imparcial*, May 25, 1993).

With regards to the regulation limiting the horsepower of outboards, it was common knowledge that most motors owned by cooperatives are 75 hp, and a large number of these were bought after May 18, 1991 for the 1991-92 fishing season. Smaller engines reduce the mobility of fishermen and make travel to distant bays and estuaries much more risky.

What the above regulations and their implications for the inshore sector indicate is that, instead of conservation being the driving force, other goals are more important: specifically, the economic weakening of the inshore cooperative sector through a diminution in the possibility of maintaining or increasing yields. An obvious consequence of this is an enhanced access to blue shrimp for the offshore sector, and, further, a certain guarantee to the private sector that the government will do its best to increase the offshore catch by reducing competition from the inshore sector.

The offshore sector, however, was also subjected to new regulations – the effects of which actually benefit that sector. As written by the National Fisheries Institute,

the regulations primarily address trawling depths. Shrimp fishing and the use of trawl nets is prohibited between 0-5 fathoms – revising a previous 10-fathom line and thus actually extending the fishing space for trawlers at the expense of the inshore fishery. There were no other regulations which in any way modified trawling practices.

Despite evidence which suggests overexploitation of the resource as well as overcapitalization of the offshore sector, new regulations do not address any of these concerns. Quite to the contrary, the permissive character of the National Fisheries Institute regulations toward the offshore sector, and the timing in which this is manifested, actually provide an assurance to the private sector that government regulations will not interfere or limit their possibilities of success. Moreover, the new regulations assure that trawlers have the upper hand in the competition for blue shrimp with the inshore sector.

Final Moves

The last step in the privatization process is the proposed sale of the parastatal marketing company, Ocean Garden, a company that has been consistently praised for its efficiency. Several private parties are competing to acquire the brand name in order to guarantee an organized export market. In Guaymas there are two groups involved in the bidding, CANAINPES and GIPSA (*Grupo Industrial Pesquero*). The CANAINPES, stronger of the two, has vowed not to purchase, process or market any shrimp harvested by the inshore sector.

While awaiting the outcome of its bid for Ocean Garden, CANAINPES took up another battle, one which the cooperatives had been waging unsuccessfully for a decade. The coalition of private owners approached the governor of Sonora and the directors of *Petróleos Mexicanos (Pemex)* for a reduction in the price of diesel fuel, the major running expense for the offshore trawlers. PEMEX, a parastatal, acquiesced to a 20% reduction, and the governor promised an additional 20% reduction, to be underwritten from the *Secretaría de Hacienda y Crédito Público*, the public treasury (Véjar Larrañaga 1993).

Conclusions

The sale of Ocean Garden will consummate the process of privatization in the Mexican shrimp industry. While the offshore sector has yet to demonstrate that it can be profitable under private ownership, enough has occurred to allow some preliminary observations on the process itself, under the shroud of structural adjustment.

First, in view of the manifest comparative disadvantage of the offshore sector vis-à-vis the inshore sector, one must question why the private initiative has flourished there. The answer appears self-evident. In Mexico's new economic order, not only has the private sector been privileged over the cooperative sector, but large-scale investment opportunities have been favored over small ones. Capital which fled to country, or simply hid in unproductive holdings during the crisis decade of the 1980s, had to be given inducements, big ones, to be put back to work. The offshore shrimp sector, once very lucrative, then overexpanded and bankrupt, was one such opportunity, and entrepreneurs grasped at it.

Second, the relatively clear and parsimonious reading of the economic and ecological ills of the offshore sector in the 1980s – too many trawlers – got submerged into another interpretation. This reading, which fuels the spate of new regulations in the early 1990s, claims that the inshore sector is both inefficient and too efficient. The key technology of the sector, the *chinchorro de línea*, cuts and kills shrimp, so this reading goes, and also captures too many. The economics and mechanics of the net refute the first claim, as do the buying preferences of Ocean Garden. The second claim is purely a distributional one. The offshore sector, by promulgating measures to restrict the activities on the small-boat sector, is simply trying to increase its access to shrimp.

Third, the uneasy local arrangements of the 1980s – the coexistence of the inshore and offshore sectors within a beleaguered federation of cooperatives, and the relative autonomy of local managers from the Mexico City bureaucracy – have been undone. In the new Mexican economy which fosters decentralization and deregulation, the local private sector is demanding increased regulation of the inshore sector, increased enforcement of these regulations, and subsidized fuel for its trawlers. Officials from Mexico City, from the state of Sonora, and from the parastatal oil company are complying with these demands.

Finally, in a further irony of the rhetoric of adjustment, the technologies of efficiency and resiliency – the *panga* and its assorted gear – have been assaulted by the technologies of inflexibility and inefficiency. The business acumen that is presumed to accompany private entrepreneurship is again absent in Guaymas, as the *armadores* petition a responsive ministry to extend the season, to capture the shrimp bearing next season's product.

The industry in the Gulf of California has indeed adjusted. There are fewer boats in operation. But the fundamental changes attending *la iniciativa privada* have been distributional ones, efforts to reduce the comparative disadvantage of the offshore sector by debilitating the inshore sector.

Notes

1. Although shrimp landing statistics for the Gulf of California are notoriously faulty due to an active black market, reported catches for two ports, Guaymas and El Golfo de Santa Clara, show a 70 and 80% drop, respectively, from the 1989-1990 to the 1990-1991 seasons. The arguments marshalled by the scientific community to refute the notion of stock collapse have been assessed in McGuire (1991).

2. The *suripera* is a net tied to two poles which extend outward from each side of the *panga*. It is open on one end, forming a mouth through which shrimp enter. The gear must be constantly moving against the current and against the direction of shrimp.

References Cited

Aubert, Hernan, and Marcela Vásquez León
1993 The Ethnography of Fishing. In: Thomas R. McGuire and James B. Greenberg (Eds.), Maritime Community and Biosphere Reserve: Crisis and Response in the Upper Gulf of California. *Occasional Paper No. 2*. Tucson, Arizona: Bureau of Applied Research in Anthropology, University of Arizona. Pp. 49-75.

CRIP
1992 *Boletín Informativo No.33*. Guaymas, Sonora: Centro Regional de Investigacion Pesquera.

Chávez, E.A., and D. Lluch
1971 Estado Actual de la Pesca de Camarón en el Noroeste de México. *Revista de la Sociedad Mexicana de Historia Natural* 32:141-56.

Hewitt de Alcántara, Cynthia
1992 Economic Restructuring and Rural Subsistence in Mexico: Maize and the Crisis of the 1980s. *Discussion Paper No. 31*. Geneva: United Nations Research Institute for Social Development.

Lustig, Norma
1992 *Mexico: The Remaking of an Economy*. Washington, D.C.: The Bookings Institution.

McGuire, Thomas R.
1991 Science and the Destruction of a Shrimp Fleet. *Maritime Anthropological Studies* 4(1):32-55.

Miller, Margaret
1990 Shrimp Aquaculture in Mexico. *Food Research Institute Studies* 22(1):83-107.

Nader, Ralph *et al.*
1993 *The Case Against Free Trade: GATT, NAFTA, and the Globalization of Corporate Power*. San Francisco: Earth Island Press.

Rodríguez, Raul
1993 Desplazan los foráneos a 600 pescadores: IRDP. *El Imparcial*, Hermosillo, Sonora, June 16.

Rodríguez de la Cruz, María Concepción
1987 Aspectos socioeconómicos de la pesquería y el cultivo de camarones en México. Ms. Rome: Food and Agriculture Organization, United Nations.

Salinas de Gortari, Carlos
1992 *IV State of the Nation Report*. México, D.F.: Dirección General de Communicación Social, Presidencia de la República.

Secretaría de Pesca
1991 *Diario Oficial de la Federación*. Mexico City, Sept. 26.

Véjar Larrañaga, Alfredo
1993 Reducen 40% diesel marino. *El Imparcial*, Hermosillo, Sonora, November 12.

Weintraub, Sidney
1990 *A Marriage of Convenience: Relations Between Mexico and the United States*. New York: Oxford University Press.

Zedeño M. Nieves and Hernan Aubert
1993 The Spatial Organization of Offshore Shrimping. In: Thomas R. McGuire and James B. Greenberg (Eds.), Maritime Community and Biosphere Reserve: Crisis and Response in the Upper Gulf of California. *Occasional Paper No. 2*. Tucson, Arizona: Bureau of Applied Research in Anthropology, University of Arizona. Pp. 76-89.

Appendix:
Calculations of Economic Efficiency for the Offshore and Inshore Sectors

The Offshore Sector

The following calculations of costs and revenues are based on prices for the 1992-1993 shrimp season. The information was provided by a private owner, a cooperative and the export company, Ocean Garden. The calculated average shrimp price of $9.70 per kg includes a border crossing fee, insurance, freight, packaging and processing costs, and a sales commission for the export company.

Calculation of Costs of Production

Costs of production are calculated for a 30-day trip at the beginning of the season. As the season progresses, the use of diesel and oil will tend to go down as boats switch from fishing blue and brown shrimp to fishing only brown. In the former case the engine runs 24 hours per day while in the latter case it runs about 18 hrs per day. It is assumed here, based on historic patterns, that an average of 6 30-day trips are made per season per boat. The following are the average costs for a single trip.

Diesel (1,100 lt per day at $.28 per lt)	$ 9,240
Oil	$ 400
Food	$ 1,167
Health insurance ($5,666.7 per season)	$ 944.4
Permits ($314.6 per season)	$ 56.94
Estimated equipment repair ($9,768 per season)	$ 1,628
Credit	$ 2,404.6
Subtotal costs	$15,840.94

Added to the costs of production are the salaries to the crew, which are estimated on a share basis: 20.27% of price times total catch (9.70x).

Calculation of Minimum Necessary Benefits per Trip to Break Even

$$TC - TB = 0$$
$$15{,}840 + .2027\,(9.70x) - 9.70x = 0$$
$$15{,}840 = x(-1.97 + 9.70)$$
$$x = 2{,}049.16$$

A boat needs to produce a minimum of 2,049.16 kg of shrimp per trip at an average price of $9.70 per kg in order to break even (TC = TB). Thus, for a season a minimum of 12,294.96 kg must be produced: production above this limit can be considered net benefit.

The Inshore Sector

The following calculations of costs and revenues are based on prices for the 1992-1993 shrimp season. The information was provided by the Guaymas inshore shrimp cooperative and individual members, as well as the export company, Ocean Garden. The calculated average shrimp price of $10.69 per kg. This price is higher than for the offshore sector since the inshore sector tends to produce better quality shrimp, the majority of which are blue.

Calculation of Costs of Production

Initial investment:

Panga speed boat	$2,167
Engine Yamaha 55 hp	$5,233
Net (400 m)	$ 430
Total	$7,873

It is assumed that the engine and *panga* may last for about 8 years (although a *panga* may last for 20 years). An engine may last for 2 years after which minor repairs will be needed every year. Both *panga* and engine are used throughout the year for the fishing of different species. The net fabric (*paño*) has to be changed every 2 seasons, while the rope, buoys, and lead (collectively, *relinga*) may last for about 5 seasons. The net is only used for shrimping, thus, it is only used during the shrimp season.

Costs of production are estimated on a daily basis. The season lasts an average of 2 months, of which an average of 36 days are actually worked.

Engine ($654.125 per year)	$ 1.79
Engine ($350 per year on repairs)	$ .96
Panga ($270.88 per year)	$ .74
New *paño* for net ($121 per season/30 days)	$ 4.03
Relinga ($46.17 per season/30 days)	$ 1.53
Gas and oil	$50.00
Total costs per day	$59.05

Daily salary to crew ($5 per kg/ 10.69 = 47%): 47% of price times total catch (10.96x).

Calculation of Minimum Necessary Benefits per Trip to Break Even

$$TC - TB = 0$$
$$59.05 + .47\,(10.69x) - 10.69x = 0$$
$$59.05 = (-5.02 + 10.69)x$$
$$x = 10.66$$

A *panga* needs to produce a minimum of 10.66 kg of shrimp per day at an average price of $10.96 per kg in order to break even (TC = TB). Production above this level can be considered net profit.