

# Cooperatives and Development: The Lobster Fishermen of Belize

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This study examines the development of a marine resource, spiny lobster (*Panulirus argus*), in the Western Caribbean nation of Belize. The lobster fishery is managed by fishermen-controlled marketing cooperatives. The nation's four cooperatives sell directly to American wholesalers, earning Belize's 1,000 cooperative fishermen prices equal to those received by Florida's spiny lobster fishermen (Noetzel and Wojnowski 1975, 25). Local control of the industry has important financial and ecological advantages. The cooperative societies provide fishermen with a stable market, guaranteed prices, access to capital, and a collective political voice. Belizean cooperatives have fought for laws that exclude foreign fishermen from local waters. They have lobbied against destructive fishing gear such as dragnets and scuba equipment. Through the cooperatives' enforcement of minimum lobster sizes and a four-month closed season, the lobster fishery appears to operate within the margins of sustainable yield while providing both stable employment and capital for local development.

The relative isolation of this Caribbean coast, its colonial heritage, and low population density has hindered the development of internal markets (Parsons 1954). As such, the region is dependent upon the export of primary products to foreign markets. This pattern of economic dependency is characterized throughout Latin America as "underdeveloped development," which is conditioned by unequal and exploitive relationships of dependence upon the metropolis (Frank 1967). Belize's economic history is a chronicle of underdevelopment, fostered by different cycles of exploitive resource extraction. "In these circumstances," noted Gordon (1981, 3) in his study of Belizean development, a metropolitan-oriented industry creates localized prosperity in the host country because of high productivity of labor and high commodity prices in the early days of growth. As the resource declines in abundance and accessibility, the normal state of net drain on the financial as well as material resources of the host country continues.

The creation of a cooperative lobster fishery, while very much dependent upon foreign markets, differs significantly from other Belizean resource booms. The progressive manner in which the resource is managed and marketed militates against the many socially exploitive and ecologically destructive aspects inherent in the extraction of primary resources for export.

Unlike Belize's poorly managed forests that were grossly depleted during the nineteenth and early twentieth centuries, the lobster fishery has enjoyed better stewardship. Adopting policies that insist on local control of the resource, use of artisan fishing methods, and a blend of modern and traditional conservation practices has insured greater stability. Fishermen have invested their profits in their equipment as well as small businesses, adding greater economic diversity. Finally, significant gains in housing, education, and services were acknowledged by the 60 fishermen interviewed. <sup>1</sup> The material and social gains experienced by Belize's fishing communities are an important example of grassroots development. Such changes were made possible, for the most part, by a progressive marketing system and local resource management.

## **FROM "TRASH FISH" TO RESOURCE**

Lobster was not a resource for the scattered fishing communities of Garifuna and mestizo people who settled the coast during the nineteenth century. They assessed it as "trash fish," good for bait but unacceptable to eat. Likewise the marine resources of Belize were scarcely utilized by the British, who controlled the territory from the seventeenth century until its political independence in 1981. Green turtle, exported during the nineteenth century, was the exception (Craig 1966, 35; Henderson 1809, 43). Yet, Belize's cay-strewn coast, sheltered by a 2000-mile barrier reef, provides an ideal habitat for lobsters. Here spiny lobster roamed

in abundance, relatively undisturbed by the exploits of Caribbean fishermen until the mid- twentieth century.  
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Spiny lobster was reappraised as a resource in 1915 when an American hired Belizean fishermen to gather lobster with bully nets for his cannery (BNA, Manuscript # 1280-17), however, during the next three decades production was limited and sporadic. The patterns and techniques of the contemporary fishery did not develop until after World War II when American buyers and processing facilities arrived. Different American buyers controlled the fishery during the late 1940s and 1950s, and although they provided a steady market, the fishermen received only six to sixteen cents a pound for their catch (Smith and Gothman 1947,6; Bradley 1952). With the introduction of marketing cooperatives in the 1960s, economic and social conditions greatly improved for fishermen. Through collective processing and marketing, the foreign middlemen were eliminated and larger profits realized.

### **Fishing Cooperatives: Origin and Function**

Beginning in 1953, the colonial government established a Department of Cooperatives and Credit Unions to help Belizeans form credit unions, consumer cooperatives, and marketing co-ops. Weekly radio shows encouraged farmers to collectively market their goods while department officials held training workshops in villages throughout the country (Cooperative and Credit Union Annual Report. 1954, 2). Despite official support of cooperatives, the colonial authorities were at first reluctant to award a fishing cooperative with an export quota, claiming the fishermen were unprepared to manage their own affairs. Nevertheless, in 1960 Northern Fishermen's Cooperative Society formed with only 35 members, as many skeptical fishermen were unwilling to give up the security of working for the American buyers (Vega 1978). The new cooperative exported its first product in 1961 and paid its members ten cents more per pound than the foreign companies. During the 1962-63 season, Northern's fishermen received ninety-five cents a pound for their product, nearly five times more than non-cooperative fishermen. Financially, the cooperative movement began to make sense to skeptical fishermen. Politically, government officials welcomed the success of the cooperatives and protected them; by 1965, only cooperatives received export quotas for marine products. British support for a Belizean-run fishery was no doubt enhanced by the 1964 shift in colonial policy to eventual self-rule.

Eight years after Northern's formation, Belize had five fishing cooperatives owned and managed by Belizeans (Figure. 1). Today, four cooperatives remain: Northern, National, Caribeia, and Placencia. During the past five years production of frozen lobster tails has exceeded 600,000 pounds a year, earning cooperative fishermen about \$5 million annually. Membership continues to increase, topping 1,000 in 1985, with 70 percent of the membership split between Northern and National Cooperatives (Annual Reports 1985).

The popularity of the cooperatives is attributable to three important factors: reliable handling of the product, the better prices received by fishermen, and access to low-interest loans. Each cooperative has its own receiving station and processing plant, where hired employees (usually women) wash, package, and freeze the delivered lobster tails. Operational decisions are made by the managing committee, who are fishermen elected at each cooperative's annual meeting to oversee production. The managing committee negotiates with foreign buyers for prices and shipment schedules. Usually, a cooperative will establish a relationship with a particular buyer, working exclusively with him for several years, but the contract is renegotiated each year. Northern Cooperative, for example, has sold its frozen tails to the Red Lobster Inn restaurant chain since 1983.

Since the formation of the first cooperatives, lobster exports have steadily increased (Figure 2). Yet the jagged peaks of the graph suggest a cyclic pattern of production in which two or three good years are followed by a low-harvest year. Fishermen and fisheries managers speculate that this cyclic pattern is caused by low years of larval recruitment, possibly related to slight changes in ocean currents or lagoon temperatures (Hernkind 1980).

Fortunately for the fishermen, even the negative effects of a bad year have been offset by a continual rise in

lobster prices. Prices received by each cooperative depends on its buyers and competition from other sources (Table 1). During the 1970s lobster prices jumped, bringing new wealth. Many fishermen began expanding their operations by making more traps and buying larger outboard motors. The cooperatives assisted in this growth by making available low-interest loans for the improvement of gear. These loans provide ready access to capital, a service greatly appreciated and used by members.

Among fishermen, the fundamental measure of a cooperative's success or failure is the amount of the "second payment." Since 1970, lobster fishermen receive a standard first payment upon delivery of their product to the co-ops. At the end of the season, after operating expenses are subtracted from total sales, the fishermen receive a second payment that varies year to year depending on the selling price of the product and the total catch. This second payment is a lump sum calculated by multiplying the fisherman's catch for the season by the second payment price. In 1985, the first payment price was set at \$6.00 BZ a pound, yet the range in second payment values varies widely. Second payments for the **[end p. 59]**

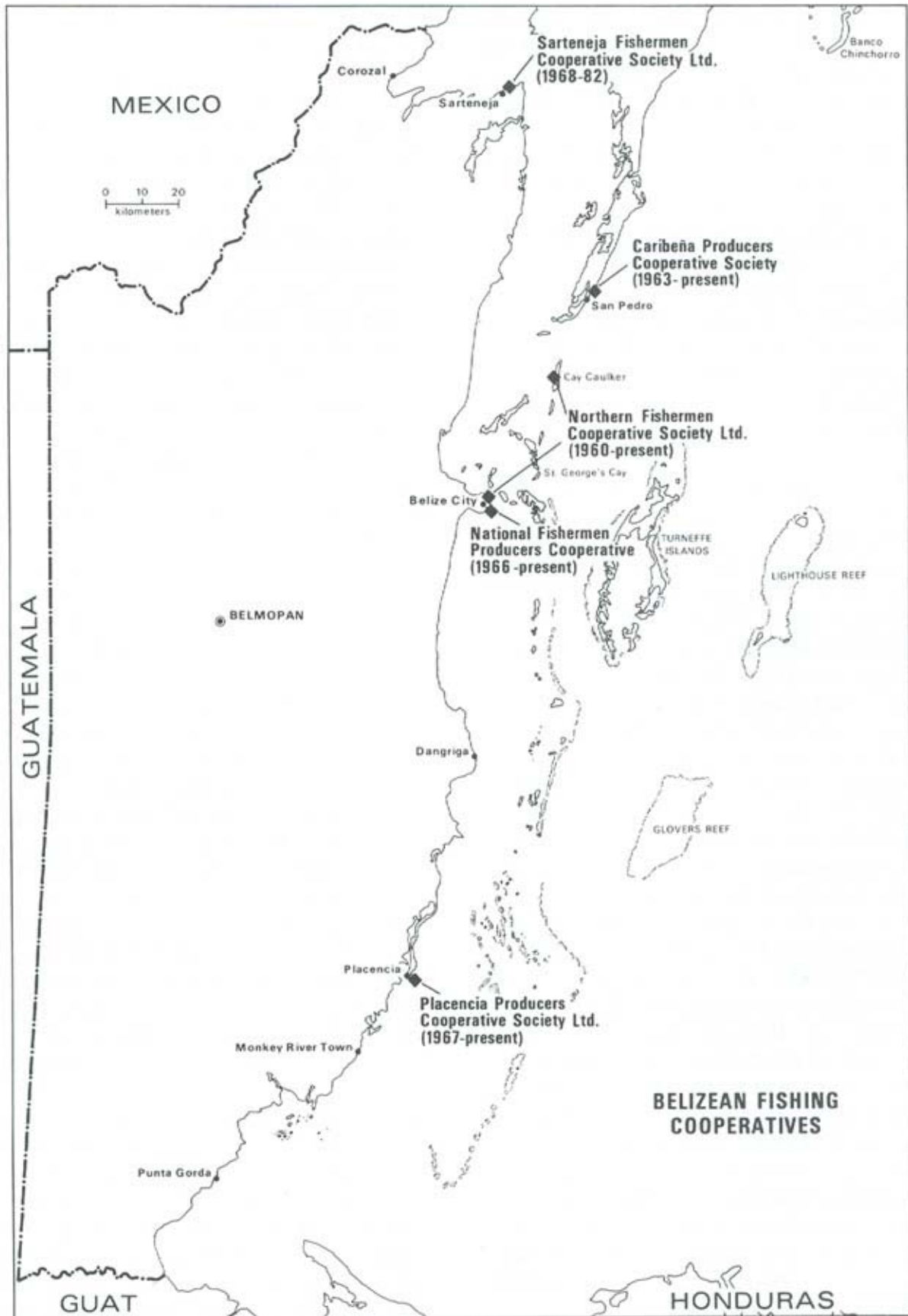


Fig. 1. Belizean fishing cooperatives. (Source: Fisheries Unit, Belize, 1985.)

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1984-85 season ranged from \$1.00 BZ to \$8.75 BZ a pound depending on the cooperative.<sup>2</sup>

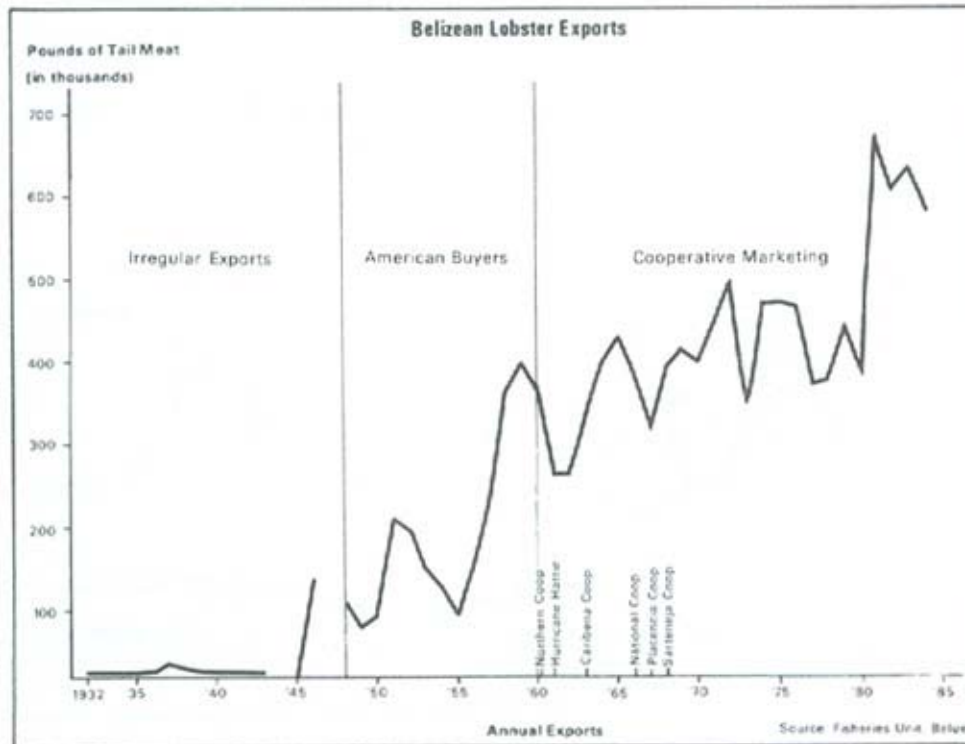


Fig. 2. Belizean lobster exports. Exports represent more than 95 percent of the total catch. (Source: Smith and Gotherman 1947; Fisheries Unit, Production Figures 1948-1985.)

This difference in second payments is keenly felt by fishermen. If a cooperative continually offers low second payments the members may join a more prosperous cooperative, sell directly to restaurants who offer a better initial price, or sell to fishermen from other cooperatives who agree to give them a portion of their second payment. Thus, once a cooperative has a troubled year its problems are compounded by member desertion, declining production, rising processing costs, and a reduction in the season's profits that make up the second payment. One bad year easily becomes a string of bad years, which leads to the closure of a cooperative. Such problems caused Sarteneja to close in 1982, another co-op is in danger of closing, and a third is suffering from a steady decline in production. Meanwhile the two Belize City cooperatives continue to thrive, offering the highest second payments and exporting 80 percent of the country's lobster (Figure 3). The closure of a cooperative does not stop a man from fishing, it simply causes a change in membership.

Catch rates vary widely among cooperative fishermen, yet they do earn much more than independent fishermen who sell at the local markets. The Ministry of Trade fixes the local retail fish prices far below those received by cooperative fishermen to insure inexpensive fish for Belizeans (Adams 1985,50). While no production records are kept for independent fishermen, they generally sell scale fish at \$1.00 and \$3.00 BZ per pound. In comparison, cooperative members at Northern received \$13.75 BZ a pound for lobster in 1985. Calculations made from Northern Cooperative's second payment schedules showed that the median trapper earned \$14,780 BZ for his lobster catch while the median diver made \$7,040 BZ. In contrast, the estimated

per capita income for Belizeans in 1984 was \$2,000 BZ (World Bank 1984, xi).

## FISHING PRACTICES

Currently, the most important fishing practices among Belizean fishermen are trapping with wooden traps and diving with masks, fins, and hook sticks. Wooden traps, like those used by New England lobster fishermen, are used in the clear protected shallows behind the reef at depths of five to twenty-five feet. Each trapper establishes territories or "pieces of water" in which some 200 to 400 traps are placed. This traditional system depends upon fishermen respecting each others territories, yet as lobster increases in value, challenges to water claims are common.

Table 1. Prices received by cooperatives for lobster tail.

Lobster Season	Price per lb. in \$BZ <sup>a</sup>
1962-63	.80
1963-64	.80 - .87
1964-65	1.00 - 1.50
1965-66	1.50 - 2.00
1966-67	2.00
1967-68	2.00 - 2.65
1968-69	3.25 - 4.75
1969-70	3.50 - 3.75
1970-71	3.12 - 4.95
1971-72	4.50 - 5.46
1972-73	5.10 - 5.80
1973-74	5.00 - 6.70
1974-75	6.00 - 6.50
1975-76	9.40 - 9.40
1976-77	10.45 - 11.42
1977-78	9.40 - 10.70
1978-79	11.50 - 14.05
1979-80	10.50 - 14.16
1980-81	12.00 - 15.00
1981-82	14.50 - 18.00
1982-83	15.00 - 16.50
1983-84	15.60 - 17.75
1984-85	15.00 - 17.50

Sources: Second-payment schedules from Northern, National, Placencia, and Caribena; annual reports from Sarteneja; 1962-66 figures from the Department of Cooperatives and Credit Unions.

<sup>a</sup>\$1.00 Belize equals \$.50 U.S. Each cooperative negotiates independently with wholesale seafood buyers and prices may change during the season, which accounts for the range in prices.

Diving for lobsters began in the late 1950s with the introduction of masks and fins to San Pedro fishermen. This innovation quickly took hold, allowing more men to catch lobster easily and cheaply. Divers swim the reef and rocks with hook sticks looking for lobsters hidden under rock [end p. 61] crevices. When a lobster is spotted, the diver hooks its soft underside and then deposits the catch in his canoe-like dory. The diving is done without tanks at depths of five to thirty feet.

Divers and trap setters dominate the fishery but their respective methods vary in productivity and use of the marine environment. Divers account for three-fifths of the cooperative fishermen while trap setters comprise the remaining two-fifths. In comparison, 52 percent of the catch was delivered by trap setters, 37 percent by divers, and the remainder was unidentifiable during the 1985-86 season.<sup>3</sup> Divers are more numerous but far less productive than trappers. The mean catch for Northern Cooperative's trappers during the 1984-85 season was 1,568 pounds, but its divers only averaged 610 pounds. The gap between these two methods of production is relatively new. A comparison of 50 trappers from Northern with 50 divers from Caribeia from 1965 to 1970 showed that the trappers only averaged 100 to 150 pounds more per season.<sup>4</sup>

Several reasons account for the lower catch by divers. Since the 1970s the amount of area set by trappers has increased, which means that divers are losing water to trappers. Of the twenty active divers interviewed, all of them complained of too many traps. The traps, they insist, are attractive to the lobster, leaving fewer lobster in the rocks and reef. Divers do not have territories; the areas they work are open to any man with a mask and dory. In comparison, trappers control their numbers by dividing a bay or reef section among themselves. Often, they establish fish camps on remote sites to protect their areas. Finally, the practice of diving, which is more likely to kill undersized and egg-bearing lobster, could be affecting the reproduction of lobsters in areas heavily worked by divers.

### MODERN AND TRADITIONAL CONSERVATION PRACTICES

The first lobster regulations were imposed in 1948, an early date considering the tendency in the region to exhaust resources rather than conserve them. The 40-year-old ordinance has been only slightly modified since its implementation. Enforced by the Fisheries Unit and the Cooperatives, the restrictions include a closed season from March 15 to July 15, a tail-size minimum of four ounces, and protection of soft-shelled and egg-bearing lobsters. The law also prohibits the use of diving tanks and spear guns. Cooperative compliance with the law is fundamental to its observance. Officers from the Fisheries Unit inspect restaurants and local markets for the sale of undersized or out-of-season lobster, but without cooperative support enforcement would be impossible. Problems arise when alien fishermen from

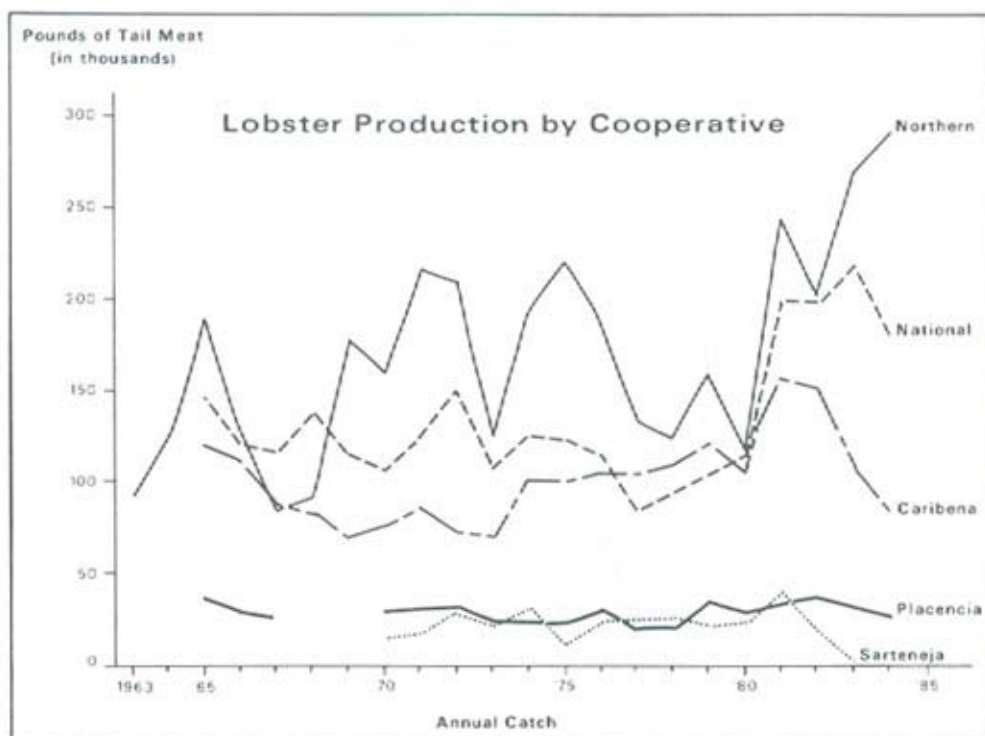


Fig. 3. Lobster production by cooperative. (Source: Annual Reports, 1963-1985.)

Honduras or Guatemala illegally work Belizean waters, ignoring both the closed-season and gear restrictions. Since the Fisheries Unit has very limited patrolling capability, many offenders go unchecked. Local fishermen, however, often take matters into their own hands, letting interlopers know that trespassing is not tolerated.

National law specifies that Belize's marine resources are for the exclusive use of Belizeans (BFCA 1985, 1). Since 1965, requests from foreign firms to harvest, process, or export fish have been rejected. This protective measure is aimed at keeping fishing profits in the hands of Belizean fishermen. It encourages a reliance on local capital, which keeps the fishing technology relatively simple. Even though the gear used by Belizeans is quite simple, some observers of the fishery express concern about the rising number of traps placing too much pressure on the lobster stock.

Management of the spiny lobster resource is challenging because so little is known about its life cycle, especially at the critical larval stage (Cobb and Phillips 1980). Even the simplest questions concerning migration patterns, fecundity, and diet are only partially understood. The core of Belize's lobster management program is the protection of immature (undersized) and egg-bearing stock. As yet, no limit is set on the amount of lobster an individual fisherman can harvest. Nor is there a limit upon the number of lobster that can be delivered in anyone season. Establishing a seasonal catch limit is advisable but not very popular and difficult to enforce.

In conjunction with these formal regulations, a network of traditional territories and fishing rights serve to limit access to the resource. Territoriality among Belizean trap setters is particularly strong. Their fishing method depends upon returning to the same well-known sites each year so they can set and find their traps by familiar water marks. An intricate component of this territorial etiquette is [end p. 62] knowing and respecting the territories of one's neighbors. Trespassing in another man's area usually implies foul play either by pulling a competitor's traps or setting traps too close to another man's site. This division of territories depends upon the mutual respect and vigilance of established fishermen who question all suspicious interlopers found in their waters.

The concept of individual territories in Belize dates back to the use of traps in the 1920s. Before trapping, each village's fishermen plied their local waters, usually within a one hour sail from the village (Gordon 1981, 184). These communal territories were not divided into individual pieces but were considered the shared domain of the village, and collectively harvested. With trap setting came the need for individual territories. Now, "pieces of water" are either passed down from one generation to the next or pioneered in open waters unclaimed by trappers. Nearly half of the forty trap setters surveyed in 1985 had acquired some of their territories from fathers, uncles, or grandfathers. Respect for the territories of fishermen is important for internal harmony within fishing communities. More importantly, territories limit entry into an area, a practice that conserves marine resources (Acheson 1975; Johannes 1982; Berkes 1985).

### **THE EFFECTS OF A COOPERATIVE FISHERY**

While the cooperatives have contributed to better management of marine resources and increased profits, many older fishermen stressed the important role cooperatives played in changing their lives. Besides providing new income opportunities, the cooperatives brought generators and electricity to villages such as Cay Caulker, San Pedro, Sarteneja, and Placencia. Processing facilities hired villagers for packaging, bookkeeping, and plant management. Having a locally owned business bolstered a sense of village pride and symbolized their greater financial independence. Even grade school children learn about co-ops in their lessons.

The steady and lucrative income provided by the cooperatives changed village form and amenities. Thatched huts were replaced by board cottages on stilts with wooden shutters and porches. Running water was piped into sinks from each home's well and electricity was made from village-operated oil-burning generators. These facilities enabled the installation of toilets, televisions, refrigerators, and washing machines. The profits from cooperative marketing also changed fishing gear. Wooden sailboats were replaced by outboard-powered skiffs and traps increased, as did the number of men fishing. By way of comparison, the fishing villages of Hopkins, Barranco, Seine Bight, Monkey River, and Gales Point only received electricity via government projects in the late 1970s. The houses, although mostly board cottages now, are much smaller and less comfortable than those in the villages with cooperative fishermen. Running water and indoor plumbing are still rare in these villages.

Important social changes and choices resulted from access to more capital. Families on Cay Caulker, San Pedro, Placencia, and Sarteneja began insisting on better schools for their children. Sending children to Belize City to receive a high school education gradually became an option. Some producers could even send their children to universities in the West Indies or the United States. New money yielded greater mobility, a chance to travel in the Caribbean and the United States. Families also began small businesses, diversifying their income source. One long-time trap fisherman-now restaurant owner-explained that he wanted his sons to learn other skills than fishing because "they need some other way to make a living in case the lobsters go scarce. "

Fear of over-fishing, a drop in market value, or a desire to do something new has resulted in fishermen starting family-run businesses. Small groceries, hotels, and restaurants have been the most popular. Many of these operations are associated with a budding tourist industry, which shows steady growth from the investment of local capital. Cay Caulker, home of the first cooperative, has fifteen small hotels--fourteen of them owned by lobster producers and started with capital from fishing. San Pedro has thirty hotels, with one third of them owned by lobster fishermen; foreigners own the remainder. Likewise, four of Placencia's seven hotels are operated by fishermen. Not surprisingly, these simple hotels are run by the wives and daughters of fishermen as their "home" business. For many fishermen these simple and inexpensive accommodations are quite profitable.

The development of a service sector based primarily on tourism is often criticized as a poor development strategy. Yet the capital required to open a small hotel or restaurant, built and run by local labor, is not great. The creation of hotels and services encourages other businesses to form. The advantage of investing in a hotel is that the business can be operated by family members, while fishermen continue producing. As a fisherman gets older and retires, having a small business brings in revenue. More importantly, local investment keeps capital circulating within the Belizean economy, rather than having it disappear abroad.

## CONCLUSION

The introduction of locally-owned and operated fishing cooperatives has greatly improved the welfare [end p. 63] of fishing families in Belize. The transition from a foreign-controlled to a locally owned fishery increased fishermen's profit share and spurred local development. Likewise, Belizean control of the resource resulted in sounder management practices, incorporating both modern and traditional conservation techniques.

Granted, there are many factors beyond the control of Belize's lobster fishermen. If for some reason the price of lobster suddenly drops, or if vital lobster nurseries are polluted, the fishery could collapse. Foreign markets may close for a variety of political reasons, typified by the banning of Nicaraguan lobster from U. S. markets in 1981. Dependency on a larger system is not peculiar to Belize. All fisheries are subject to changes in taste, declines in market values, and environmental disruption. An advantage of dependency upon lobster, as opposed to other marine resources, is the excellent price it commands. The steady demand and consistently high price of lobster bodes well for fishermen dependent on exports.

Each development success story is a product of its unique history and cultural context; in spite of the many socio-economic theories, the exact route to development is uncertain. This study details the institutions, techniques, and environmental milieu that shaped Belize's lobster fishery. The health of the fishery and the economic well-being of the fishermen is enviable compared with other Caribbean examples. The combination of progressive marketing cooperatives with artisan fishing practices and conservation policies make Belize's fishery an important model for other Caribbean fishermen.

**NOTES** 1. Sixty cooperative members each responded to an hour-long survey concerning changes in fishing methods and the effects of cooperatives. 20 additional interviews with government officials and retired fishermen also provided valuable information.

2. The Second Payment amounts are quoted in each coop's Annual Report. The four coops kindly granted me

access to their 2nd Payment Schedules. These show each fisherman's catch for the season and make income calculations possible.

3. These figures are based on the combined estimates by each cooperative's Executive Secretary as to the productivity of trappers and divers.

4. The 1965 to 1970 trapper/diver comparison was made between Northern Cooperative trappers (identified by cooperative records) and Caribeña divers because this datum was the most reliable.

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