MANAGING THE FISHERIES OF JAMAICA AND BELIZE: THE ARGUMENT FOR A CO-OPERATIVE APPROACH

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Paper presented at the Third Annual Conference of the International Association for the Study of Common Property (IASCP), Washington D.C., U.S.A., September 18-20, 1992

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ABSTRACT

The fisheries of Belize and Jamaica are at opposite extremes: one a healthy export fishery, the other at the brink of collapse. The socio-economic context of the two populations is different, as are the management strategies in place. A substantial portion of the Belize fishery is managed by a number of community-based fishing co-operatives, which have input into state regulating institutions through the Belize Co-operative Fishermen's Association The Jamaican fishery is almost totally open access, exploited almost entirely by the informal sector Jamaican fishing co-operatives are small supply co-operatives, with no resource management functions. The paper explores the impact and potential of fishing co-operatives and fishermen's associations on the management of fishery resources drawing on the experiences of Belize and Jamaica. It examines the role of culture and tradition, and in doing so it performs a critique of community-based approaches to resource management.

Keywords: BELIZE, CO-OPERATIVES, COMMON PROPERTY RESOURCE MANAGEMENT, COMMUNITY-BASED MANAGEMENT, FISHERIES MANAGEMENT, FISHING CO-OPERATIVES, JAMAICA, MARINE RESOURCES, NATURAL RESOURCE MANAGEMENT, RURAL DEVELOPMENT.

It is now a cliche that fisheries management does not mean managing fish but managing the fishers. However, the power relations and structures of dominance which this latter phrase implies do not accord with notions of empowerment and community democracy which are integral to the concept of development.

Indeed, attempts by fisheries biologists, fisheries departments and conservationists to impose upon fishers various fisheries management regimes have met with limited success. Such attempts may blame fishers for depleting fishery stocks through non-sustainable activity, identify fishers as "part of the problem", and devise strategies for controlling or channelling their fishing effort. This approach often leads to conflict between fishers and environmentalists, as the latter attempt to enforce laws which they have engendered while the former fight for survival against those they perceive as trying to erode their traditional rights.

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1 The research project from which the data for this paper was obtained was funded by the International Centre for Ocean Development (Halifax, Nova Scotia, CANADA) and executed by the Fisheries Division, JAMAICA, the Fisheries Department, BELIZE, and the University of the West Indies, Mona, JAMAICA.

As long as fisheries management is treated fundamentally as a **Biology Problem** (for biologists to solve) struggle between the technocrats and the fisherfolk is to be expected. What this approach lacks is an appreciation of common property issues, the dynamics of the culture of fishing, and the socioeconomic parameters within which both operate.

On the theoretical level fisheries management needs to be viewed as a **Rural Development Problem**, where common property and other socio-cultural issues can be addressed in a multidisciplinary manner. On the practical level it would be more appropriate to advocate that fishers become "part of the solution" as full members of the management team.

INSTITUTIONAL ASPECTS OF FISHERIES MANAGEMENT

There are very few fisheries which can be effectively managed solely by a government bureaucracy. Among developing (underdeveloped) countries the cost of enforcement alone would render such a course unworkable. However the role of the state in fisheries management cannot be disregarded; the state is the trustee of the natural environment for present and future generations, and has the duty to ensure that renewable natural resources are not exploited beyond the limits of sustainability; but in performing this function the state has to recognize and respect the right of contemporary resource users to have a say in how the resources are exploited and managed.

One of the most useful institutions for acknowledging and respecting the rights and roles of the many interests in the fishery sector, and which allows the most participation in **policy formation**, is the broad-based Fisheries Management Council (FMC). Such an institution -- which can be given legal status -- could be comprised of government bureaucrats, fisheries economists, fisheries biologists, environmentalists, fishers and/or fishers' organizations, fish processors and rural development scientists, to name a few. By being inclusive rather than exclusive, the FMC can seek to achieve a workable consensus on management strategies, and from within, can provide assistance in implementation, as well as perform a monitoring and enforcement function.

Councils such as this already exist in many countries, but many only have functions advisory to the state. What is proposed is an institution with such credibility that once consensus is attained government consent is almost unavoidable. Because FMCs of this type limit the real power of politicians and the state they may not become established through government initiative; there is the need for the other interests to organize themselves (nationally) to advocate for the establishment of Fisheries Management Councils.

Once FMCs set national (regional and local) policy, there is need for other institutions on-the-ground to actually manage the resource from day-to-day. Should the state perform this function? As stated above the role of the state in fisheries management cannot be disregarded, but the **principle of subsidiarity** applies here[2]. If fisheries management can be performed efficiently by local groups then the state should step back. If fishers are prepared to obey the regulations agreed to in the FMC, and to police one another and outsiders, then the day-to-day management of the fishery should be left in their hands.

At the local level there are a number of possible institutional structures through which fishery resource management may take place: e.g. fishing co-operatives, fishers' associations, trusts, and limited liability companies. There is always the option of creating special (even species specific) local management organizations.

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2 The principle of subsidiarity asserts that the state should not arrogate to itself functions which can be performed efficiently at the local level by local groups.

This paper advocates the Fishing Co-operative as the best type of organization to manage fishery resources at the local level. Several reasons are advanced: fishing co-operatives already exist in many areas; they are legal entities, they have tax-free status at law, they can perform economic, social and organizational functions, and they have a complementary mission in the area of development.

Below is a look at the fisheries of Belize and Jamaica to illustrate the relevance of co-operatives for resource management. Unless otherwise stated, empirical data referred to is taken from surveys conducted by the author in Jamaica and Belize in 1991 as part of the **Reef Fisheries Management Project** executed by the University of the West Indies, Mona, Jamaica, in conjunction with the Fisheries Division, Jamaica and the Fisheries Department, Belize and funded by the International Centre for Ocean Development (ICOD).

JAMAICA AND BELIZE

Jamaica and Belize have a similar history of British colonialism, similar political structures and per capita GDP; but the differences are not to be underemphasized. Jamaica is less than half the size of Belize with thirteen times the population (see Table 1). The pressure on Jamaica's environment to provide food, clothing and shelter for its population is correspondingly greater; higher unemployment will lead to greater efforts by the poor to exploit open access resources like forests and fisheries.

As the crow flies, Belize City is only 750 miles from Kingston (See Figure 1). Both countries have significant reef fish, lobster and conch fisheries; but Belize exports 95% of the value of its catch while Jamaica is a net importer of fish.

The Belizean economy is growing. Recent efforts in garment and light manufacturing, tourism, aquaculture and agriculture will increase employment opportunities; if fishers opt for part-time status or to enter other occupations full-time, some pressure may be lifted from the fishery. The outlook for the Jamaican economy is not as optimistic, and it is likely that, under present management arrangements, the pressure on Jamaica's fishery will increase. There is therefore some urgency to master the dynamics of the Jamaican Fishery and to develop effective management strategies.

TABLE 1: DEMOGRAPHIC DATA ON JAMAICA AND BELIZE

	BELIZE (1988)	JAMAICA (1989)
Population	192,000	2,484,957
Area	22,963 Km^2	10,962 Km^2
	8,862 $mile^2$	4,232 $mile^2$
Population Density	21.7/$mile^2$	587.2/$mile^2$
	8.4/Km^2	226.7/Km^2
Per Capita GDP	US$1,284	US$1,348
Unemployment	15.0%	21%
Life expectancy	66.0 years	70.0 years
Infant mortality	36.4/1000	20.0/1000
Crude birth rate	36.1/1000	22.6/1000
Crude death rate	6.0/1000	5.5/1000

Source: Caribbean and Central American Databook 1990.

THE FISHERIES OF BELIZE

Belize is the second smallest country on the American continent, being 174 miles at its longest and 68 miles at its widest. Its eastern boundary is the Caribbean Sea, with Mexico to the north and Guatemala to the south and west. From 15-25 miles off the coast is an almost continuous 400 mile-long barrier reef running parallel to the coastline from Cozumel on the Yucatan coast to the Sapodilla Cays in the Bay of Honduras[3]. Inside the reef the water is rarely deeper than a few metres, and over a wide area is 3-6m deep; outside the reef the bottom drops away abruptly to between 300-1,000m deep.

Inside the reef there are innumerable low-lying cays ranging from a few acres to a few square miles; some are swampy with a complete cover of mangroves, while others are dry, white sand dotted with coconut trees. Outside the barrier reef are several reef areas. **Chinchorro Bank** in the North is Mexican territory but belongs to the same geological system. About 6 miles outside the barrier reef off Belize City is **Turneffe**, a mass of reefs, swampy islands and cays stretching for about 30 miles in a North-South direction and enclosing a large lagoon. Further south and about 30 miles outside the barrier reef is **Glover's Reef**, a shoal area about 12 miles long by 6 miles broad enclosed within a reef and with a few coconut-bearing cays in the south-east corner. Slightly further North than Glover's Reef, and considerably further offshore, is **Lighthouse Reef**, similar to Glover's Reef but almost twice as long (See Figure 2). These reef areas are separated by deep submarine trenches, and outside Lighthouse Reef, the sea floor drops off precipitously to the abyssal depths of the trans-Caribbean Bartlett Trough.

The combination of warm, shallow bays and lagoons, mangrove fringed cays, great expanses of reef and abyssal depths form ideal habitats for myriad species of marine life, making Belizean waters one of the more productive fisheries in the Caribbean.

THE EMERGENCE OF CO-OPERATIVES

The Belize reef fishery has supported subsistence fishing activity by the indigenous Amerindian population for several hundred years, but only recently has been commercially exploited. Before 1920, says Edmund Tayloe Gordon in a useful 1981 study of the fishing village of San Pedro on Ambergris Caye, the spiny lobster *Panulirus argus* was considered by Belizean fishermen to be trash fish. Like conch, he says, it was usually eaten by the poor, and then only rarely. Since there was little domestic demand, and effective methods for capture were not available, lobster was not fished.

The local demand for finfish, lobster and conch was so limited that fishers had to try to sell their catch in adjoining Mexico and Guatemala. Gordon reports that, in the early 1900s:

> "... San Pedranos were the major users of fish traps (heart weirs) in the country. With these, both lobster and great quantities of fish were being caught. As more San Pedranos returned to the village to take part in the fishing industry, more traps were set up and more fish caught. The problem was that there was not a sufficient domestic market to absorb all these fish and, with the glut, fish prices were extremely low. ... Having emptied his traps, [a San Pedro fisherman] took a full load of fish to market in Corozal in his smack. Reaching Corozal he found a line of smacks all trying to sell fish. There was no room for him even to dock. As he waited, the fish in the live well in his hold began to die because they could not tolerate the fresh water in the harbour. On this trip he ended up selling only three dollar's worth of fish and dumping the rest. On his next trip, he ran into similar problems managing to sell only nine dollar's worth of fish. One solution to a

3 The longest continuous barrier reef in the world, second only to the Great Barrier Reef of Australia.

glutted market was to find a new one. However, the only viable new markets were outside the country. Those outside markets that could be reached by individual fishermen, i.e. Chetumal and Honduras (desiring mostly dried fish) were already being serviced."[4]

Due to the instrumentality of the Roman Catholic Church (particularly Fr. Ganey, S.J., a Jesuit Catholic priest), the co-operative movement in Belize began in 1943, and is still quite strong. By 1958 there were 38 credit unions in Belize, 3 consumer co-ops, 1 housing co-op and 16 agricultural producers' co-ops. The government Department of Co-operatives and Credit Unions regularly conducted training courses in co-operative formation.

In the early 1950s there had been an unsuccessful attempt to form a fishing co-op among the lobster fishers of Caye Caulker[5]. Fr. Ganey, S.J. addressed a meeting of fishers, but they remained unconvinced. In the late 1950s two Belizean companies owned by foreign interests purchased lobster at US$0 40/lb and sold in the USA at US$2.40/lb, earning significant profits. The need was clear for Belizean fishers to earn a greater share of the profits for themselves. In 1958 Caye Caulker fishers approached the Registrar of Co-operatives[6] re the formation of a fishermen's co-op. By 1959, 39 Caye Caulker fishers formed a pre-co-operative with a share capital of B$662 and applied to the Colonial Government for registration and an export quota for lobster. They were denied both on the grounds that they did not have the ability to manage a business; this reflected the power of the foreign lobster interests who, with the collaboration of the colonial state, sought to maintain their monopoly on the lobster export trade.

The purchasing companies immediately began to harass the Caye Caulker fishers by late purchase of their catch, and eventually by offering a lower price than paid to other Belizean fishers. The Caye Caulker fishers decided to boycott the companies, and placed their catch in cold storage. It was a period of great nationalist fervour in Belize, and the emerging co-op played on it to the full. They made their boycott public, they agitated, they threatened demonstrations, and they played on the nationalist sentiments of the Belizean public -- all to put pressure on the government, which eventually broke down, registered the co-operative and gave them a lobster export quota.

So the **Northern Fishermen Co-operative Society Limited** was registered on September 5, 1960 not without some struggle. At that time it had 44 members from Caye Caulker and a share capital of B$1,504; in its first year of operation it exported 158,678 pounds of lobster worth B$26,735 through an agent in Belize. Within a year of establishing their own processing plant and marketing operation, the fishers were able to double their individual incomes, even with an inefficient operation. Soon, fishers who had migrated in hard times returned to take part in this new boom. Other fishing co-ops were soon established and this form of economic organization so has come to dominate the fisheries sector that today, only co-ops may legally export fishery products.

Each fishing co-op is owned and operated by the fishers themselves. In general meeting they elect from among themselves a managing committee of seven, who are empowered to run the affairs of the organization. They each employ an executive secretary or manager who in turn employs a plant manager (who handles the products from receiving to packaging and freezing) and accounting staff. Each co-op conducts the marketing of its seafoods independently of the others.

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4 Gordon (1981) page 141-142.

5 Sources for this history are Gordon (1981) Chapter 5; and Vasquez (1990).

6 By this time Fr. Ganey had been reassigned to work in co-operative formation in the South Pacific.

The other registered societies are:

Placencia Producers Co-operative Society Ltd.	June 23, 1962
Caribena Producers Co-operative Society Ltd.	March 1, 1963
National Fishermen Producers Co-operative Society Ltd.	April 29, 1966
Sarteneja Fishermen Co-operative Society Ltd.	July 2, 1968
Southern Fishermen Co-operative Society Ltd.	1971
Central Fishermen Co-operative Society Ltd.	1973
Western Fishermen Co-operative Society Ltd.	1974
Baranco Fishermen Co-operative Society Ltd.	1980
Hopkins Fishermen Co-operative Society Ltd.	1983
Independence Fishermen Co-operative Society Ltd.	1985
Toledo North Fishermen Co-operative Society Ltd.	1986
Mullins River Fishermen Co-operative Society Ltd.	1988

Not all function today. The Sarteneja, Southern, Western, Barranco and Mullins River co-ops are defunct, while the Hopkins co-op is struggling.

Caribena, the third fishing co-op formed (in San Pedro), was the first co-op to export fish as one of its major products, and by 1966 almost 50% of its profits were derived from trading in products and services other than lobster tails.

It is estimated that between 50-60% of Belizean fishers are co-op members. Many independent fishers sell through the co-ops and to the public in fishmarkets located in the coastal towns. Fish vendors also buy wholesale for sale in the interior. In addition, there are an undetermined number of subsistence fishers, especially in the South. Legally, independent fishers are only entitled to sell on the local market, but it is suspected that a sizeable illegal trade with Mexico, Guatemala and even Honduras is taking place.

In the survey, co-op members gave an overwhelming vote of confidence in their co-ops. Fully 92.4% felt that they have benefitted from membership. The marketing and credit functions of the co-ops are most appreciated by about half the co-operators surveyed. The co-ops buy all marine products offered them for sale -- even from non-members -- as long as they meet the required quality standards. The co-op price for finfish is just slightly lower than the retail price offered in the public fishmarket. The co-op, therefore, siphons off all production in excess of local demand.

Members receive a substantial second payment (or bonus) at the end of each financial year which represents a distribution of profits proportional to the amount of business done with the co-op that year. This second payment may, on occasion, be equal to the first. Non-members receive only the first payment, and so it is in the interest of the co-ops to buy as much as they can from non-members. If members have loans, repayments are deducted from their sales; in addition, several charges to do with the overhead expenses of the co-op will be deducted. It is for this reason that many members do not sell all their catch to the co-op. Being a co-op member is a decided advantage to a specialist in lobster and conch, the demand for which in Belize is small. Many co-op members sell their lobster and conch through the co-op, but sell their finfish in the market.

At present there are an estimated 2,500 licensed fishers and an unknown number of subsistence fishers. Most of the licensed fishers specialize in lobster and conch, and many catch nothing else. No official estimates of fish production by independent fishers, or of total catch in Belize, exists.

At the end of 1963 the three fishing co-ops in existence at that time discussed and explored the possibility of jointly forming a federation of fishing co-ops -- the **Federal Sea Products Marketing Co-operative** -- to centralize processing and marketing, which would allow the primary co-ops to concentrate on providing their memberships with services and facilities to improve individual production and productivity. These efforts were unsuccessful because the primary co-ops feared they would lose control over their two major functions -- processing and marketing -- which control had led to the substantial increase in their incomes. They preferred independent operations (which could compete with each other) rather than surrendering to or sharing one central processing and marketing association.

A federation of fishing co-ops, the **Belize Fishermen Co-operative Association Ltd.** (BCFA) became a legal entity in 1970 with the five primary co-ops in existence at that time as members. Its members gave it no mandate to engage in the processing and marketing of marine products, but rather to provide legal, educational and technical services to its members. Interestingly, none of the seven fishing co-ops formed after 1970 became members of the BCFA. In summary, the objectives of the BCFA call upon it to do "such things as shall serve the welfare of its members and the people of Belize". In carrying out its objectives, the BCFA:

* maintains a close watch over all matters which affect the welfare of its members;
* represents the fishing co-operatives in dealings with government and private organizations on matters of concern to its members;
* presses for legislative action that will establish policies for the further development of its members;
* obtains for and disseminates to its members the most up-to-date processing and marketing information;
* initiates, sponsors and promotes modern fishing techniques using modern fishing equipment;
* promotes an interchange of ideas and information between the societies; and
* fosters closer co-operation and a true co-operative spirit among members.

Is there satisfaction with this institution among fishers? Malcontents there will always be, but 90% of co-op and independent fishers expressed satisfaction with the operations of the BFCA.

The Ministry of Agriculture, Fisheries and Co-operatives (MAFC) is empowered with responsibility for the administration of all matters pertaining to fisheries and co-operatives in Belize. The Fisheries Unit of Belize was established on January 1st, 1965 -- five years after the first co-operative was formed. Directed by a **Fisheries Administrator**, its functions are:

* to administration and manage the fisheries resources of Belize;
* to be a liaison between the fishing community and the Ministry;
* to conduct research on commercial species;
* to perform extension work on new techniques and trends;
* quality control;
* enforcement of the Fisheries Law and Regulations; and
* to advise the Ministry generally on all matters affecting the industry.

The Fisheries Advisory Board (FAB) is appointed by the Minister of Agriculture, Fisheries and Co-operatives. It is composed of ten members plus a secretary, as follows: two persons from the government sector, four representatives of the BCFA and one of the co-operatives that are not members of the BCFA, and three other persons from the public at large whom the Minister may appoint.

The terms of reference of the FAB is as follows:

* To advise the minister on all measures proposed for the organization, improvement, management and continued development of the fishing industry of the country;
* To initiate proposals to government for the orderly continued development of the industry;
* To recommend practical measures for the control of the fishing industry and to keep a close watch on the marketing facilities both at home and abroad; and
* To advise government on any matters pertinent to the fishing industry which may from time to time arise.

SOME SOCIAL PARAMETERS OF THE BELIZEAN FISHER

On the average, co-operative fishers are slightly older than independent fishers, and have had slightly more children. A higher proportion of the children of co-operative members live in the same home with them, possibly because they can afford to support them. Almost half the co-op members (47.0%) have been able to travel overseas during the last five years, compared with 19 4% of independent fishers. Significantly more co-op members read more fishery related material than independent fishers.

TABLE 2: SOCIOECONOMIC PROFILE OF THE BELIZEAN FISHERMAN, BY CO-OPERATIVE STATUS

PROFILE	CO-OPERATIVE	INDEPENDENT
AVERAGE AGE	38.5 YEARS	35.2 YEARS
AVERAGE NUMBER OF KIDS	2.73	2.10
NUMBER UNDER 18 YEARS	1.42	1.18
NUMBER OF KIDS WITH YOU	2.50	1.75
ANY TRAVEL DURING LAST 5 YRS	47.0%	19.4%
ANY READING ABOUT FISH	45.2%	25.9%

THE FISHING CULTURE OF CO-OPERATIVE AND INDEPENDENT FISHERS

FISHING GEAR

Hook and line is the most common method of catching finfish among both co-operative and independent finfishers, but moreso among the latter. The use of fish traps is the second most common method overall, but moreso among the former. Laws (which are enforced) restrict where fish traps may be placed, and customary rights to fishing grounds also restrict the setting of fishtraps by outsiders; these factors may explain why the use of fish traps is not the most common method (as in Jamaica).

Spearfishing is more common among co-op members, probably because more of them dive for lobster and conch, and may shoot fish along the way. More free lance fishers -- who do more finfishing -- use gillnets for more intensive fishing effort.

When asked which fishing method they preferred, the independent fishermen overwhelmingly preferred lines, and the co-op members had a slight preference for traps over lines. Reasons given for preferring lines include a love for reeling in the catch; reasons given for preferring traps include the fact that the traps do the fishing while they can do something else.

THE CREW

Fishing is becoming less of a traditional family activity as children gain secondary and tertiary education and set their sights on other occupations. The prevalence of the share system over payment by wages suggests that there is still some considerable traditional character to the relations of production and that the industry has not yet been completely proletarianized. The extent of wage labour in the industry -- 23.1% in the co-ops and 31.4% among independent fishers -- is fairly advanced.

Relatively few Belizean fishers -- 30% of co-op members and 24% of independents -- report a second occupation. Interestingly 11.5% of co-operative members and 4.6% of independent fishers reported fishing as their second occupation. Tourism and a variety of wage work were the main occupations of these part-time fishers. The dominant secondary occupations are in tourism. It is quite clear that co-operative members are in the best position to invest in the boats and other equipment needed to take advantage of Belize's fast-growing eco-tourism. Other secondary occupations include trades (carpenter, mason, etc.), farming, and supplementary occupations to fishing (pot making, net making, boat building).

THE FISHERIES OF JAMAICA

Jamaica is an island in the Northern Caribbean Sea 90 miles south of Cuba and 450 miles north-east of Nicaragua and Honduras.

In 1989 Jamaica imported J$10,445 million worth of goods and exported J$5,548 million, leaving a trade deficit of J$4.897.8 million[7]. Fish as a commodity has contributed significantly to this imbalance; in 1989 Jamaica imported 17,000 metric tons (mt) costing J$200.7 million and exported only 3,500 mt valued at J$10.1 million contributing J$190.6 million to the trade deficit (3.9%).

FISHING GROUNDS

The most useful categories in which to divide Jamaican marine fisheries are **inshore** and **offshore**. The main difference is logistical (distance, availability of food, fuel, etc.) rather than fishing technology or type of fish caught, which, except for the net fishing on the south shelf, does not vary appreciably.

The inshore fishing grounds of Jamaica are located on the island's shelves (North and South), and on a number of banks which are relatively close to shore (see Figure 2). The **south shelf** has a mean width of 24 km (15 miles) and is about 150 km long (100 miles). It has a maximum width of 64 km (40 miles) and an area of 258,590 ha. Large reefs are limited to the east; elsewhere, coral reefs tend to be small, patchy and often senescent, although the sill reef is well developed along most of the edge of the shelf.

The **North shelf** is a thin strip bordering the mainland. Not more than 1.6 km (1 mile) wide at any point, it is 25,910 ha in area. A mix of fringing and barrier reefs extend, with few gaps, from one end to the other, and active reef growth has been observed to depths of 70 m.

The **inshore banks** are easily reachable from shore by motor-powered canoe. Travelling out in the early morning fishers haul, harvest and reset pots, or, using SCUBA gear, hunt for lobster and large fish with spearguns. They are able to return with their catch by midmorning to midday.

The **Offshore fisheries** include the Pedro and Morant Banks, and waters and banks outside Jamaican jurisdiction as far north as the Bahamas, south to Venezuela and west to Honduras and Nicaragua. Most of the banks depicted on Figure 3 have been visited by Jamaican offshore fishers. The largest fishing operations occur on the Morant and Pedro Banks which lie within the territorial waters of Jamaica.

The Pedro Bank (about three-quarters the size of the land mass of Jamaica) is the largest of Jamaica's oceanic banks, with an area of about 804,000 ha. Located 60 miles (95 Km) southwest of Kingston, its circumference is about 590 km and mean depth about 24.5m. There are three cays on the Pedro Bank, two inhabited by fishers while the other is a bird sanctuary. Packer boats travel to the Banks bringing supplies and purchasing fish. By law, persons without special licenses are not permitted to remain on the cays for any extended period of time or do any type of fishing. **Morant Bank**, the second largest, is much smaller [about 100 square miles (160 km^2)] and is located about 64 km (40 miles) southeast of Kingston. It too contains three small cays, two of which are inhabited by fishers while the third is a bird sanctuary.

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7 ESSJ (1989), Table 3.1, page 3.1. Imports: US$1,826.3 million, Exports: US$970 million, Trade Deficit: US$855.9 million.

THE CATCH

The main resources exploited in the Jamaican fishery are demersal coral reef species of finfish and shellfish, and pelagic species of finfish. There are more than 200 species of coral reef fish landed in Jamaica. These include surgeonfish, snappers, goatfish, grunts, triggerfish, parrotfish and groupers. Of these, seventy species constitute over 90% of all landings, while twenty-three species comprise more than 80% (by weight) of all fish caught in traps in the demersal fishery[8] -- a truly multi-species fishery. The pelagic fishery consists of oceanic species such as blackfin tuna, little tuna, dolphin fish (bonito), blue marlin and sharks, and coastal-dwelling or inshore species such as herring, anchovies, half-beaks, mullet and jacks.

The small mesh size of the majority of fish traps results in large harvests of small and immature fish, which are not thrown back but are sold for "fish tea" or animal fodder. This has resulted in the noticeable depletion of the fishery resources.

About seven species of marine shrimp (**Penaeidae**) are taken on a small scale on the south coast. Sahney reports that in 1981 the total landed shrimp catch was 22,053 lbs. with a market value of J$102,632 [0.1% and 0.3% of total fish landings by weight and value][9]. The south coast contributes 97% of the total landed catch, with north shelf and the Pedro bank contributing the rest.

Six species of lobster are caught by trap, speargun or by hand. The most common are the spiny lobster (***Panulirus argus***) and the chicken lobster (***P. guttatus***). Sahney reported that in 1981, the 518,334 lbs. of lobster caught and sold for J$1,587,432 constituted 3.3% of the total fish catch and 4.6% of its value. The south shelf contributed 310,193 lbs or 67% of the total lobster catch[10].

A total of five species of conch live in shallow seagrass beds at depths not exceeding 60m[11]. Several private companies exploit the conch resource under license. There is growing information on the conch resource of Jamaica which indicates that the exploitation of this resource has already exceeded the maximum sustainable yield.

THE FISHING CULTURE OF JAMAICAN FISHERS

THE GEAR

The principal item of fishing equipment used in Jamaica's artisanal fisheries is the Z-type antillean fishpot, a fish trap using a skeleton of mangrove, wild coffee, sweetwood or lancewood sticks covered with meshwire of 4.13 cm (1.25 in) maximum aperture. The average trap size is 180 x 120 x 60 cm, and 64% of all fishing boats use fish traps. Other common gear are gill and seine nets (18%), hook-and-line (16%) and spearguns (1%). The use of dynamite is not uncommon. In a recent survey conducted by this author, three persons admitted using dynamite as a regular fishing method.

Jamaican fishers use a mix of gear; in the abovementioned survey all the possible dual combinations were observed. The most common dual gear combination on the south coast of Jamaica was **pot & line** (17.1%) followed by **pot & gillnet** (16.1%) and **line & gillnet** (10.9%).

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8 Munro, 1974; quoted by Aiken (1984), page 16.

9 See Table 3.15.

10 See Table 3.15.

11 See Aiken (1979).

THE SHARE SYSTEM

As with farming systems, traditional fishing arrangements have a mutual character consonant with the co-operative spirit. Even though boat crews are becoming more proletarianized, the traditional **share system** where the catch is divided into equal portions according to certain rules is still in operation: **First**, before the catch is divided, the value of fuel and food consumed is subtracted; **Second**, each person -- the labour units -- receives an equal share in their own right; from boat owner (if he is present) to cox'n to lowly junior crewman, each receives the same share for their labour; **Third**, the boat receives a share which is paid to the owner, present or not; **Fourth**, the owner of any special gear (like the fishing net) receives an extra share. If four men go net-fishing then the catch will be divided in six after food and fuel have been subtracted: one share for each man, one for the boat, and one for the net. If four men go line-fishing (bringing their own lines) then the catch will be divided in five: one share each and one for the boat.

The share system suits the crew because without any capital outlay each can earn a reasonable income. It also suits the boat owner because alone he cannot use the boat to its full potential. Some owners, however, might feel that they should receive more on their capital investment, which might lead to them offering a daily wage instead of a share. The arrangements usually work in favour of the owner, for if the catch is poor, they often revert to the share system so that the owner does not incur so great a loss.

The share system has three advantages. First, all concerned share the risk. If the catch is good then all benefit; if the catch is poor then all suffer. Second, having an interest in the size of the catch increases individual fishing effort, especially if the owner is not present. Third, productivity remains high as the partnership will expel incapable or lazy fishers and give others a try.

The share system is based on trust. An absent owner will trust the crew to turn over to him (or her) a fair share of the proceeds. Each fisher in the partnership expects the others to pull their weight and do their portion of the workload.

More than one-third (35.4%) of the south coast fishers surveyed fish alone. Almost three-quarters (73%) of those who fish with others receive their remuneration under the share system described above. Proletarianization is significant; 11.5% of fishers work for wages. As with other customary labour-sharing systems (like **day-for-day** and **morning sport** in small-scale agriculture) the share system in the fishing industry can be expected to decline as the individualism and distrust -- which accompanies a market-driven economy -- becomes more dominant.

As long as the boats are relatively small (28 ft) and the catches are moderate the system will work to everyone's advantage. If boat sizes (and number of crew) increase then the size of loan repayments may make the share system unprofitable for the boat owner. The share system as used by the fishers is **rational** within the constraints of resource availability, catch size and fishing effort required. The spirit of the share system is an indicator of the potential for co-operative action among fishers.

THE DISTRIBUTION SYSTEM FOR THE DOMESTIC FISH CATCH

The vast majority of Jamaica's fish catch is sold fresh through the domestic internal marketing system either directly to the consumer or indirectly through fish processors, fish chefs or restaurants. The informality of Jamaica's marketing systems are well known and researched[12], but informality does not mean disorganization or inefficiency. From harvesting to marketplace the system is well-defined and structured.

Figure 9 outlines the route fish travel from capture to consumer. From the traditional fishery on the north and south shelf, fishers land their catch at one of the many fishing beaches by mid-morning where higglers[13] and consumers are waiting to buy. **Wholesale Fish Higglers** buy in bulk to sell to the public, but mostly to other higglers who buy in smaller quantities and who may not be able to attend the beach. **Retail higglers** sell to the consumers in the public markets, on the sidewalks, or travel around to customers regular, occasional and accidental.

At the Pedro Cays, when the carrier vessels or packer boats arrive, the Cay-based fishers haul their fishpots and sell the catch to these vessels; the fish is transported to the Kingston Fisheries Terminal (or other Southcoast landing site) packed in ice where a larger array of higglers and public are waiting at dockside. Restaurants, processors, etc., purchase at beaches and the Terminal as well as from wholesale higglers. Some mainland-based canoes haul pots at the Pedro Bank on a regular basis, as was common before fishers took up residence there.

These marketing arrangements are wholly unregulated and unmonitored (and hence untaxed); each factor acts in its own interest and fish moves quickly from trap to table. The government is not involved in any way with the marketing of fresh fish.

The key factor here is that the demand for marine fish far exceeds the local supply, and that the structure of this fish marketing system suits a situation of high demand and low supply. The fish is landed in relatively small amounts in over 200 locations across Jamaica, and all the fish is either immediately sold is or appropriated by the fishers for family use; there is no surplus.

Until catch volumes increase dramatically no changes in marketing arrangements would seem necessary.

FISHERS AND THEIR ORGANIZATIONS[14]

There is no record of any fishers' organization before 1939. Thompson says "At various times these men have attempted to organize themselves, particularly in Kingston, but these attempts have ended in acrimony and suspicion"[15]. Acrimony, suspicion, jealousy and lust for power have been the undoing of many sectoral and community organizations, no less for fishers' organizations.

In 1939 an attempt was made to organize all fishers into an **All-Island Fishermen's Guild**. The purpose of the organization was to better the lot of fishers by providing credit and co-operative marketing. By 1945 little was left of the Guild; Thompson suggests that its organizers underestimated the magnitude of the task they set themselves, especially the need for careful preparation and co-operative education.

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12 See Katzin (1973), Mintz (1974)

13 A higgler is a petty or not so petty trader who "buys and sells".

14 The early part of this section follows Thompson (1945), section XIX, pages 66-67.

In 1945 there were two other fishers' organizations in Kingston. These were the **Kingston Co-operative Fishermen's Association** registered under the Friendly Societies Act. and the **Kingston Fishermen's Credit Union** organized by the Jesuit Catholic priests at Winchester Park and registered under the Co-operative Societies Law[16]. About 150 fishers mostly from East Kingston were active members of both organizations. Thompson reports the existence of two other fishers' organizations in rural Jamaica in 1945: one of 30-40 men at Priory in St Ann organized by the Inspector of Poor, Mr. C.C. Virtue; and one of about 80 men in Boscobel, St. Mary, organized by Mr. J.L. Hinds, the local school master.

After 1952, the **Jamaica Social Welfare Commission** (and after its formation, the **Co-operative Department**) began promoting fishing co-ops among fishers on beaches around the island. Although at present there are only six active fishing co-ops [Whitehouse (Westmoreland), Calabash Bay and Great Bay (St. Elizabeth), Rocky Point (Clarendon), Old Harbour (St. Catherine), Hope Bay (Portland), and Kingston] there have been others, including ones at Manchioneal (Portland), Milk River (Clarendon), Falmouth (Trelawny) and Port Royal. These are **supply co-ops**, providing their members with fishing gear at concessionary prices.

There is now a second-level fishers' co-op -- the **Jamaica Co-operative Union** (JCU) -- which has the primary co-ops as members, and which operates a fishing store on Beechwood Avenue in Kingston. Formerly a marginal consumer co-op (food and drygoods), the JCU changed status and focus and is now quite successful. The formal opening of their newly constructed modern premises took place in September 1990. Purchases at the JCU can only be made upon the presentation of the government-issued fisherman's identification card.

There are less of an economic rationale for fishing co-ops to exist in Jamaica than in Belize. Belizean Co-ops exist to **export** fishery products, since production far exceeds demand. In Jamaica, production of fish is much lower than the local demand, and so the **importation** of finfish is substantial. The rationale for fishing co-ops in Jamaica is **the sale of fishing equipment more cheaply** than commercial suppliers, and to be the conduit through which duty free concessions flow. Once the primary co-ops cannot deliver the goods more cheaply, their existence will be jeopardized. It is likely that none of the fishing co-ops on the beaches can achieve real economies of scale, especially with weak management; and so there is the clear need for local fishing co-operatives to find a new rationale, or fall into extinction.

OVEREXPLOITATION AND SUSTAINABLE DEVELOPMENT

The best evidence available is the Belize fishery is being exploited sustainably[17]. In 1945 Ernest F. Thompson, in his report on the fisheries of Jamaica, made these observations:

> "There is little prospect for any large increase in this local catch. In fact, the probability is that the local areas are already overfished. Increase in fish supplies for Jamaica must come from other sources than the present fishing grounds."[18]

If true in 1945, the above statement is even moreso in 1992. The paucity of bigger fish on the coastal shelves (and more recently on the offshore banks hardly fished in Thompson's time), a reduction in catch size in real terms, and a change in species composition towards more trash fish, is strong evidence that the stock is not being regenerated. An increase in fishing effort and changes in fishing practices are depleting the fishery, possibly past the point of its ability to recover. There is the need for a new initiative in the management of Jamaica's fishery.

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16 Co-operatives and credit unions were started in Jamaica by the Catholic Church, particularly through Fr. John Peter Sullivan S.J.

17 See ICOD Report 1992 on Fisheries of Jamaica and Belize.

18 Thompson (1945); page 5.

THE SOCIOECONOMIC STATUS OF JAMAICAN FISHERS

The average Jamaican fisher in the sample was 37.6 years old, while the modal age group was 21-29 years. More than one-third (36.6%) of the fishers were under 30 years old, while 21.9% are over 50 years old. In terms of fishing experience, the modal category was 10-19 years. Overall 34.9% of the sample had been fishing for less than 10 years; only 21.5% had 30 or more years experience.

The maximum formal education of 58.0% of the fishers was primary or all age school. Only 1.1% of the sample had no formal education at all, while 31.9% had attended New Secondary School and 7.0% percent had the benefit of technical, comprehensive or Grammar school education. Only 11.1% said they could not read at all, while 47.9% claimed to be only barely literate.

THE COMMUNITY-BASED APPROACH TO FISHERIES MANAGEMENT

Crutchfield has pointed out that, despite several decades of theoretical research on alternate management interventions, the application of these techniques has met with only limited success. He even goes so far as to say,

> "... the results are remarkably disappointing. The number of programmes that have actually succeeded in checking depletion of ocean fish stocks can be counted on the fingers of one hand. Those that have protected the stocks while providing some real improvement in earnings, stability of employment and ability to withstand the usual economic jolts to which fisheries are subject can be counted by someone with no hands at all. ... The solution depends on the costs of intervention and enforcement."[19]

> "The real weakness lies in our institutional mechanisms for getting something done, and for making the regulated fishing industry itself a part of the analytical and decision-making process".[20]

One might suggest that some efforts by natural scientists at ecological resource management fail because they do not contain enough social science inputs. Management of fisheries resources must include changes in the cultural practices of fishers, and to arrange this is not biology or ecology. The management team -- for best results -- must include both social and natural scientists.

One might further suggest that some efforts at resource management have failed because of a top-down approach -- the handing down of directives to fishers, and attempts at banning this or that bit of equipment or fishing method -- without the participation of the fishers in the process which led to those decisions. Management of ecological resources seeks to impose certain restrictions on the actions of fishers, but these must be involved in the collection and analysis of conservation- and management-related information so that they can share in the decision-making process or concur with decisions already taken. Community involvement, therefore, is to be seen as part of the information-gathering and decision-making process rather than just an education function -- the passing on of information re laws and sanctions. The management of a fishery is both goal and process. Involving fishers in the process is expensive in terms of time and money, but the cost of leaving them out is higher, as many have learnt to their chagrin.

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19 Crutchfield (1982); page 9.

20 Crutchfield (1982); page 10.

In short, fisheries management must be treated as a **rural development problem** subject to the analysis and strategies applied to other rural development problems. In addition, fisheries management is a **common property problem**[21] subject to the analysis and strategies applied in that area. In both fields, fishers are seen not only as part of the problem but as part of the solution.

Are Jamaican and Belizean fishers prepared to be part of the solution? The interviews basically indicated they were, although moreso in Belize. Most support **the idea** that fishers should be involved in the management of fishery resources; in fact, a large number feel that fishers should take the lead. More Belizean than Jamaican fishers expressed a willingness to turn in their peers for breaches of management policy; the exception is the use of dynamite, which they clearly abhor. This suggests that if fishers believe something to be disadvantageous they will be against it. The first challenge, therefore, is to convince fishers of the rationality of the recommended management measures. I suspect that faced with an actual situation of having to turn in someone -- probably family or friend -- few would actually go through with it; the social fallout at the community level would be intense. The greater challenge facing community based management is to make the fallout from breach of management rules greater than fallout from turning in offenders, a task for the social psychologists and social engineers.

TABLE 3: SUPPORT FOR THE FOLLOWING MANAGEMENT APPROACHES, BELIZE AND JAMAICA, 1991

BELIZE (RM = Resource Management)

MANAGEMENT APPROACH	CO-OPERATIVE	INDEPENDENT
INVOLVE FISHERMEN IN R M	130 (98.5%)	149 (96.1%)
FISHERMEN LEAD IN R M	120 (90.9%)	139 (89.7%)
TURN IN UNLICENSED F'MEN	101 (77.1%)	118 (76.1%)
TURN IN USE OF SMALL MESH	87 (65.9%)	103 (66.5%)
TURN IN RESERVE FISHERS	98 (74.2%)	104 (67.1%)

JAMAICA (RM = Resource Management)

MANAGEMENT APPROACH	SUPPORT
INVOLVE FISHERMEN IN R M	172 (89.6%)
FISHERMEN LEAD IN R M	133 (69.3%)
F'MEN MUST MANAGE RESOURCES	159 (82.8%)
TURN IN UNLICENSED F'MEN	83 (43.2%)
TURN IN USE OF SMALL MESH	67 (34.9%)
TURN IN FISHERS IN RESERVES	85 (44.4%)
TURN IN DYNAMITERS	130 (67.7%)

Of course one of the most important prerequisites for decision-making -- for fishers or for scientists -- is information. Scientists should not decide on a management strategy without the necessary information, and fishers cannot properly agree or diasgree without being apprised of the facts. How aware are Belizean and Jamaican fishers about fisheries management issues?

21 See Berkes (1987).

Both Jamaican and Belizean fishers were asked to account for reasons which could lead to a reduction in catch size and weight, and it is clear that the level of awareness among Belizean fishers is much higher. The two most common answers from the Belizean fishers were that "the resources have been depleted" and that "the numbers of fishers has increased". Significant numbers also blame fishing methods that kill young fish before they have a chance to reproduce, and foreign poachers.

The Jamaicans ventured a wide variety of opinions, none of which received wide support, and some of which show a lack of appreciation for the issues involved. "Pollution" received the most blame (15%) followed by "too many fishers" (14%). More than a few (12%) supported the apocalyptic view that "prophesy now fulfill". Some fishers blame fishing methods that destroy the reef habitat and kill young fish before they have a chance to reproduce (dynamite, seine and spearfishing). Others blame the inefficiency of their present equipment, and plead for new equipment, new grounds, fewer restrictions and more fishing time to be able increase their catch. Some blame the fish for breeding too slowly and for getting smarter and harder to catch. In general, the survey revealed a lack of appreciation of the factors which lead to the decline in fish catch in Jamaica, and points to the need for an education programme for fishers (and the public at large). In fact only 52% of Jamiacan fishers surveyed feel that it is possible for humans to abuse the sea so that it produces less, compared to over 80% of both co-op and independent Belizean fishers.

When Belizean fishers were asked "*How may the catch of fish be improved?*" the most common answer was that more and better fishing equipment must be obtained, which may be translated: "Fishing effort needs to be increased. The other common answers reveal a knowledge of different management strategies and how they might be beneficial. The fishers call for the policing of fishing areas, the detention of thieves, and an end to pollution of the marine environment. There were a few fatalists in the sample, as well as those who had no idea what should be done. Clearly some Belizean fishers are quite environmentally aware.

When Jamaican fishers were asked "*How may the catch of fish be improved?*" the presence of the fatalists was felt as 12% said that nothing could be done, and 9% said "only God could bring it back". A number of solutions were suggested, the most common (19%) being that the use of dynamite should be banned. Of course it is already banned; what the fishers must have meant is that the ban should be enforced. It is noteworthy that some support for this measure exists. The second most common answer was that the best way to improve ones catch is to obtain more and better fishing equipment, i.e. to increase the fishing effort, which will increase the pressure on the fishery. The other common answers reveal a knowledge of different management strategies and how these might be beneficial. The fishers call for, among other things, the resting of the fishing grounds, the detention of thieves and an end to pollution of the marine environment. There were also those who had no idea what should be done. Clearly some Jamaican fishers are aware of issues to do with the marine environment and with fisheries, and some of the possible management strategies which may be employed, but a great deal of information-sharing is still to be done.

Belizean and Jamaican fishers were also asked whether they supported a certain set of management options. The management strategy receiving the strongest support from Belizean fishers was the establishment of a comprehensive licensing regime, where every fisher would be required to have a valid license to fish or face the consequences. More than half of the fishers supported the licensing of sport fishers, whether Belizean or tourist. About two-thirds supported the idea of limited entry, where the number of new licenses issued is zero or limited. About two-thirds support the establishment of more "No Fishing" areas, but the gear limitation management strategies were not popular, especially with co-op members.

The only management strategy receiving strong support from Jamaican fishers was sanctions on the use of dynamite. Weak support for a comprehensive licensing regime exists, but there is little support for sanctions against those who fish without a valid license There was weak support for more no-fishing areas: gear limitation and limited entry were not popular

The fishers, after having supported the idea of their own involvement in fisheries management, do not evince strong support for the management strategies favoured by the biologists (about which they have been told little). There is every reason to believe that, presented with the relevant data and rationale, support among Jamaican and Belizean fishers for these fisheries management strategies should improve. At the same time the fishers may have their own ideas about how the fishery could be managed and the strategies which may have the best chance of success. Mechanisms must be in place which permit on the one hand communication between fishers and technocrats, and on the other among the fishers themselves.

TABLE 4: SUPPORT FOR THE FOLLOWING MANAGEMENT STRATEGIES, BELIZE AND JAMAICA, 1991

BELIZE

REASONS	CO-OPERATIVE	INDEPENDENT
ALL FISHERMEN HAVE VALID LICENSES	128 (97.7%)	149 (96.8%)
FEW NEW LICENSES PER YEAR	84 (64.6%)	108 (70.1%)
MORE "NO FISHING" AREAS	87 (68.0%)	98 (64.9%)
LICENSE LOCAL SPORT FISHERMEN	86 (65.6%)	78 (51.0%)
WIDER FISH TRAP MESH	48 (36.4%)	63 (41.7%)
LESS FISH TRAPS	37 (28.7%)	66 (43.1%)
WIDER NET MESH	43 (32.8%)	75 (50.0%)
FEWER NETS	33 (25.4%)	60 (39.7%)
LICENSE TOURIST FISHERMEN	72 (55.4%)	87 (58.4%)

JAMAICA

REASONS	SUPPORT
ALL FISHERS HAVE VALID LICENSES	107 (55.7%)
FEW NEW LICENSES PER YEAR	44 (22.9%)
FINE NO LICENSES	73 (38.0%)
MORE "NO FISHING" AREAS	109 (56.8%)
WIDER FISH TRAP MESH	49 (25.5%)
WIDER NET MESH	64 (33.3%)
FINE DYNAMITERS	157 (81.8%)
TOTAL	192

As mentioned above, one of the most useful institutions for acknowledging and respecting the rights and roles of the many interests in the fishery sector, and which allows the most broad-based participation in policy formation, is the **Fisheries Management Council** (FMC). Such a council is already established in Belize, but as yet there is no corresponding agency in Jamaica. Serious moves to establish such a council in Jamaica must be made if there

is to be any hope at all for a properly managed fishery. If fishers are to be properly represented on such an entity then they must first be organized. If there is no fishers' organization then any fishers attending meetings will be representing only themselves.

Fishers' organizations may take many forms: fishing co-operatives, fishers' associations, trusts, and limited liability companies to name a few. This paper advocates Fishing Co-ops as the best type of organization to manage fishery resources at the local level for several reasons. Fishing co-ops already exist in Belize and Jamaica and already perform functions beneficial to fishers, like marketing and supply. A healthy fishery is to their benefit, and as such, the formation of another organization would be superfluous. Co-ops are legal entities and have tax-free status at law; this gives them strong advantages over other forms. In both Jamaica and Belize fishers co-ops are already seen as representing the interests of fishers. The fact that the Co-operative Movement has complementary development goals makes an even stronger case for fishery management functions to be offered to the fishing co-ops.

If confidence is being placed in fishers' co-ops by the state to assist in fishery management then factors which might cause co-ops to not do well or to fail are therefore very important. A sizeable number of fishers surveyed identified mismanagement as the main reason why co-ops fail. Co-ops in the Caribbean region chronically suffer from this complaint, usually because their membership is drawn from the lower socioeconomic groups which, although having other strengths, tend to lack the (literacy,) management and administrative skills needed for this scale of operation, and their small turnover does not generate enough to allow these skills to be hired outside the co-op. That is not the case with the larger of the Belize fishing co-ops which turn over millions of dollars each year, and several have, in fact, employed professional managers. Even so, the need for management skills is still acute, and assisting the co-ops in this area is an essential component of any serious management or development strategy for fisheries.

A significant number suggest that co-ops fail because of a lack of leadership. Lack of leadership is different to mismanagement; it means that the membership side of the co-op rather than the business side is in difficulty. Factions, jealousy, wrangling and acrimony can cause good leaders to withdraw or not stand for election, and can lead to the breakdown of the organization. "Lack of co-operation", another common answer, refers to a similar problem.

Some Belizean respondents asserted that low production can cause co-ops to fail. This could refer to the smaller co-ops in the south of Belize, or it could refer to the suggestion that by selling to hotels, some co-op members put their own organization in jeopardy.

A relatively small number of respondents suggest that theft, dishonesty, and "Uneven distribution" (which refers to the second payment which shares the profits according to business done with the co-op) are at the root of the problem. Co-ops and their officers must be fully transparent in their activities, so that justice not only is done but also appears to be done. The numbers who challenge the integrity of the co-ops are small, so this feeling may not be widespread.

In the Caribbean, co-operatives have a "bad name". Many feel that, as a vehicle of economic and social development, it lacks the ability to work because of various entropic forces at work in Caribbean society. It is this author's view that co-ops do not deserve their "bad name". Credit Unions (financial co-ops) have performed creditably over the years, as have commodity marketing co-ops (in coffee and cocoa) and housing co-ops. Usually production co-ops, especially in agriculture -- have had difficulties achieving their objectives, and are the source of much of the poor publicity.

It is the opinion of this author that the way co-ops work in rural societies is not well understood (as indeed rural Caribbean society and economy is not well understood). Too much has been expected of co-ops in the past, and not enough support has been offered bearing in mind the larger scale of operations and the lack of literacy, accounting and management skills among lower socioeconomic groups. The existence of the share system and long traditions of labour sharing in agriculture are evidence that with the proper training, information and logistical support, fishing co-ops will be able to perform the social, economic and management functions expected of them.

BIBLIOGRAPHY

THE BELIZE FISHERY

ALAMINA, Elias. The Belize Fishermens' Co-operative Association: Working for the Belizean Fishermen and the Industry. Paper presented by BFCA Chairman Elias Alamina at the Co-operative Conference in St. John's, Newfoundland, CANADA, February 23 - March 5, 1989.

BAIRD, R.H. Interim Report on Fisheries of British Honduras. FAO TA 3203. Rome. 1971.

BAIRD, R.H. Fisheries Management and Potential: Report to the Government of British Honduras. FAO TA 3203. Rome. 1973.

BELIZE. National Fisheries Development Plan 1983-1988.

BELIZE. The Co-operative Societies Ordinance 1948.

BELIZE. The Fisheries Regulations 1963.

BELIZE. The Fisheries Regulations 1977.

BELIZE. The Fisheries (Amendment) Regulations 1986.

BELIZE. The Hol Chan Reserve Regulations 1988.

BELIZE, CENTRAL BANK OF BELIZE. Quarterly Review, March 1991. Vol. 14 No. 4, March 1991. Research Department, Belize City.

BELIZE, CENTRAL BANK OF BELIZE. Statistical Digest, December 1990. Research Department, Belize City.

BELIZE, CENTRAL STATISTICAL OFFICE. Abstract of Statistics 1990. Ministry of Economic Development, Belmopan.

BELIZE, DEPARTMENT OF CO-OPERATIVES AND CREDIT UNIONS. The Co-operative Informer. Belmopan. Vol. 5, No. 1, March 1991.

BELIZE, DEPARTMENT OF CO-OPERATIVES AND CREDIT UNIONS. The Co-operative Informer. Belmopan. Vol. 5, No. 2, June 1991.

BELIZE, DEPARTMENT OF CO-OPERATIVES AND CREDIT UNIONS. Quarterly Report, September 1981. Belize City.

BELIZE, DEPARTMENT OF CO-OPERATIVES AND CREDIT UNIONS. Quarterly Report, December 1983. Belize City.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION LTD. 11th Annual General Meeting. Y.W.C.A., Belize City, August 27, 1982.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION LTD. Annual Report 1985 to the 14th Annual General Meeting. Civic Centre, Belize City, August 17, 1985.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION LTD. Annual Report 1986 to the 15th Annual General Meeting. Civic Centre, Belize City, September 19, 1986.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION LTD. Annual Report 1987 to the 16th Annual General Meeting. Civic Centre, Belize City, September 25, 1987.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION LTD. Annual Report 1988 to the 17th Annual General Meeting. Civic Centre, Belize City, September 23, 1988.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION LTD. Annual Report 1989 to the 18th Annual General Meeting. Civic Centre, Belize City, October 6, 1989.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION LTD. Annual Report 1990 to the 19th Annual General Meeting. Y.W.C.A. Hall, Belize City, October 11, 1990.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION LTD. Bye-Laws.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION LTD. Policies for the Fishing Industry of Belize. January 11, 1985.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION. Radio Talks, BFCA, nd.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION. Newsletter. [Twenty issues from Vol. 1 No. 1, June 1984, to Vol. 2 No. 27, January 1987.

BELIZE FISHERMENS' CO-OPERATIVE ASSOCIATION. Quarterly Newsletter. [Ten issues from Vol. 4 No. 1, September 1987, to Vol. 8 No. 1, September 1991.

CARIBENA PRODUCERS CO-OPERATIVE SOCIETY LIMITED. Annual Report 1989-90.

COADY INTERNATIONAL INSTITUTE. Fishery Training Program: Co-operative Education Plan May 1983 - April 1984; Final Evaluation May 1984. Coady International Institute, St. Francis Xavier University, Antigonish, Nova Scotia, CANADA. Belize-Nova Scotia-VADA

EDUCATION TASK FORCE, A History of Belize: Nation in the Making. Belize City: Sunshine Books. nd.

FAO. Various Aspects of the Lobster and Scale Fishery in Coastal Waters: Report to the Government of British Honduras. Based on the work of John K.W. Dres and Jacob Meyer, FAO Masterfishermen. Rome: FAO. 1965.

GORDON, Edmund Taylor. Phases of Development and Underdevelopment in a Caribbean Fishing Village: San Pedro, Belize. Ph.D. Thesis, Stanford University. 1981.

NATIONAL FISHERMEN PRODUCERS CO-OPERATIVE SOCIETY LIMITED. Twenty-Fourth Annual General Meeting, Civic Centre, Belize City, June 30, 1990.

NATIONAL FISHERMEN PRODUCERS CO-OPERATIVE SOCIETY LIMITED. Twenty-Fifth Annual General Meeting, Bird's Isle, Belize City, June 29, 1991.

NORTHERN FISHERMENS' CO-OPERATIVE SOCIETY LTD. Annual Report 1990 to the 30th Annual General Meeting. Caye Caulker, June 22-23, 1990.

NORTHERN FISHERMENS' CO-OPERATIVE SOCIETY LTD. Annual Report 1991 to the 31st Annual General Meeting. Caye Caulker, June 21-22, 1990.

NORTHERN FISHERMENS' CO-OPERATIVE SOCIETY LTD Fish Price Chart. Effective Saturday, November 20, 1982.

PERRIOTT, Lloyd. Pisces. The Fisheries Unit, Ministry of Health, Housing and Co-operatives. nd.

PLACENCIA PRODUCERS CO-OPERATIVE SOCIETY LIMITED. Annual Report 1990 to the 24th Annual General Meeting.

SPEAReports 3. Profile of Belize 1989. Society for the Promotion of Education and Research (SPEAR). Belize City. 1990.

SPEAReports 4. Second Annual Studies on Belize Conference. Society for the Promotion of Education and Research (SPEAR). Belize City. 1990.

SPEAReports 6. Third Annual Studies on Belize Conference. Society for the Promotion of Education and Research (SPEAR). Belize City. 1990.

THOMPSON, Ernest F. The Fisheries of British Honduras. Development and Welfare in the West Indies, Bulletin No. 21, nd.

VASQUEZ, Herman Peter. Belize: A Profile of its Fishing Industry. BFCA 1984-85; Revised 1990.

VEGA Sr., Antonio. The Development of the Spiny Lobster Fishery in Belize from 1920-1973. Paper presented by Belize Fishermens' Co-operative Association Chairman Elias Alamina at the Agriculture & Fisheries Conference in Halifax, Nova Scotia, CANADA, February 23 - March 5, 1989.

THE JAMAICAN FISHERY

AIKEN, Karl A. "Technical Aspects of the Jamaican Fishing Industry. Annex I, Vol. 2". Identification of a Project for the Development of the Artisanal Fisheries Sector, IICA, OAS, Kingston, March, 1984.

AIKEN, Karl A. and Milton O. HAUGHTON. "A Management Plan for the Jamaican Fisheries". (mimeo). Prepared for the Ministry of Agriculture, Science and Technology, Kingston, Jamaica. 1987.

---. "Regulating Fishing Effort: The Jamaican Experience". Presented at the 40th Annual Gulf and Caribbean Fisheries Institute, Curacao, Netherlands Antilles, November, 1987.

---. "Status of the Jamaican Reef Fishery and Proposals for its Management." A paper presented at the 38th Annual Gulf and Caribbean Fisheries Institute. Martinique, November, 1985.

BECKFORD, George L. "Caribbean Peasantry in the Confines of the Plantation Mode of Production." 1984.

--- Persistent Poverty: Underdevelopment in Plantation Economies of the Third World. Morant Bay: Maroon Publishing House and London: Zed Books Ltd., 1972

BERKES, Fikret. "The Common Property Resource Problem and the Fisheries of Barbados and Jamaica" Environmental Management. Vol. 1 No. 2, pages 225-235. 1987.

BERKES, Fikret and A.B. SHAW. "Ecologically Sustainable Development: A Caribbean Fisheries Case Study." Canadian Journal of Development Studies 1986.

BERLEANT-SCHILLER, R. "Development Proposals and Small-Scale Fishing in the Caribbean". Human Organization 40:221-230. 1981.

BLACK, Clinton V. History of Jamaica. Harlow: Longman. 1983.

BODURTHA, R.M. "Fish Production in Jamaica Coastal Waters". Zoology Department, U.W.I., 1975.

BOHNSACK, James A. and Frank H. TALBOT. "Species-Packing by Reef Fishes on Australian and Caribbean Reefs: An Experimental Approach". Bulletin of Marine Science. Vol. 30, No. 3. July 1980.

CARIBBEAN/CENTRAL AMERICAN ACTION. Caribbean and Central American Databook 1990. Caribbean/Central American Action. Washington (1989).

CHUCK, L.M. "Sample Survey of the Fishing Industry in Jamaica." Division of Economics and Statistics, Ministry of Agriculture, Kingston. May, 1963.

COMITAS, Lambros. and LOWENTHAL, David. ed. "Occupational Multiplicity in Rural Jamaica." Work and Family Life: West Indian Perspectives. New York: Anchor Press. 1973.

COOPER, A. "A Preliminary Study of the Fishery for Cero Mackerel (***Scomberomorus regalis*, Bloch**) in Jamaican Waters". Proceedings of the 34th Annual Gulf and Caribbean Fisheries Institute, Mayaguez, Puerto Rico, November, 1981. James B. HIGMAN (Ed.), Miami, Florida, 1982. Pages 149-155.

CRUTCHFIELD, J.A. Keynote Address. in N.H. STURGESS and T.G. MEANEY, (Eds.). Policy and Practice in Fisheries Management. Department of Primary Industry, Pages 9-22, Australian Government Publishing Service, Canberra, 1982.

DAVIES, Omar and Michael WITTER. Issues in Food Security in Jamaica. Kingston: National Food and Nutrition Co-ordinating Committee of Jamaica, c/o Caribbean Food and Nutrition Institute. 1986.

DOLAN, P. Genesis and Distribution of Recent Sediments on Pedro Bank. Ph.D. Thesis, University College, London, 1972.

EDEL, Matthew. "Jamaican Fishermen: Two Approaches in Economic Anthropology." Social and Economic Studies, 16 (Dec 1967) 4:432-439.

ESPEUT, Peter A. An Economic Analysis of a Rural Jamaican Community. M.Phil. Thesis, University of the West Indies, Mona. 1989.

---. An Economic and Social Study of Small-Scale Fisheries in Jamaica, 1990. Prepared for the Food and Agriculture Organization (FAO) of the United Nations as a part of a Preliminary Study on the Economic and Social Situation of Small-Scale Fisheries in the English-Speaking Caribbean.

--- Fishing for Finfish in Belize and the South Coast of Jamaica: A Socio-Economic Analysis. Report of a Project funded by the International Centre for Ocean Development, Ottawa, Canada, and executed by the Fisheries Department, Belize, the Fisheries Division, Jamaica and the University of the West Indies, Mona, Jamaica. June 1992.

FAO/IDB. "Report of the Jamaica Fisheries Development Project." Vol 1 Annexes 1-4. Rept. 7/78. DDC, JAM. 7. 1979

HARVEY, Guy C. McN. "Artisanal Fisheries for Herrings in Jamaica". Proceedings of the 34th Annual Gulf and Caribbean Fisheries Institute, Mayaguez, Puerto Rico, November 1981. James B. HIGMAN (Ed.), Miami, Florida, 1982. Pages 141-148.

HAUGHTON, Milton O. "An Analysis of Statistical Data from the Jamaican Inshore Fisheries". Pages 443-454.

HAUGHTON, Milton O. "The Obstacles to Fisheries Management in Jamaica". NAGA, the ICLARM Quarterly, 10 (3):17. Manila, 1987.

HICKLING, C.F. Fisheries in the British West Indies. 1949.

HIGMAN, B.W. Slave Population and Economy in Jamaica, 1807-1834. Cambridge: Cambridge University Press. 1976.

JAMAICA. The Fishing Industry Act, 1975 (Act 17 of 1975).

JAMAICA. The Fishing Industry Regulations, 1976 under The Fishing Industry Act, 1975 (Act 17 of 1975).

JAMAICA. "Five Year Agricultural Sector Development Plan 1990-1994: Fisheries Development". (mimeo)

JAMAICA, MINISTRY OF AGRICULTURE, DATA COLLECTION AND STATISTICS BRANCH, Livestock and Feed Statistics 1979-1989. Data Bank and Evaluation Division, July 1990.

JAMAICA, MINISTRY OF AGRICULTURE, FISHERIES DIVISION. The Jamaican Fishing Industry: An Outline. (Mimeo). June 1975.

---. "Register of Fishermen and Fishing Vessels".

---. "The Status of Fisheries Development in Jamaica." 1982.

JAMAICA, MINISTRY OF AGRICULTURE, NATURAL RESOURCES CONSERVATION DIVISION AND RALPH M. FIELD ASSOCIATES. Jamaica: Country Environmental Profile. Kingston, September 1987.

JAMAICA, MINISTRY OF AGRICULTURE AND LANDS, DIVISION OF ECONOMICS AND STATISTICS. A Brief Historical Review of the Fishing Industry in Jamaica. December, 1963.

JAMAICA, MINISTRY OF DEVELOPMENT AND WELFARE, CENTRAL PLANNING UNIT, Five Year Independence Plan 1963-1968.

JAMAICA, MINISTRY OF FINANCE AND PLANNING, NATIONAL PLANNING AGENCY. Five Year Development Plan 1978-82.

JAMAICA, PLANNING INSTITUTE OF JAMAICA Economic and Social Survey of Jamaica, 1989. Kingston. 1990

JAMAICA, STATISTICAL INSTITUTE OF JAMAICA. External Trade, 1984. Kingston.

---. External Trade, 1989. Kingston.

JAMAICA, STATISTICAL INSTITUTE OF JAMAICA. National Income and Product, 1989. Kingston.

JAMAICA, STATISTICAL INSTITUTE OF JAMAICA and the WORLD BANK. Preliminary Report: Living Conditions Survey, Jamaica. October 1988.

JOHNSON, W.B. "Coastal Zone Management: Kingston Region." United Nation Centre for Human Settlements. UNDP/JAM/82/010. Tech. Report No. 9. 1985.

KATZIN, Margaret Fisher. "The Jamaican Country Higgler." in Work and Family Life: West Indian Perspectives. Eds. Lambros COMITAS and David LOWENTHAL. New York: Anchor/Doubleday, 1973.

KIRTON, Allan G. "Training Jamaican Fishermen". Fishing News International, December 1970. Pages 28-35,38.

KONG, G. Andre. "The Jamaican Fishing Industry: Its Structure and Major Problems". (mimeo). 1990.

KOSLOW, J. Anthony, Fred HANLEY and Robert WICKLUND. "Effects of Fishing on Reef Fish Communities at Pedro Bank and Port Royal Cays, Jamaica". Marine Ecology - Progress Series 43:201-212 (1988).

LONG, Edward. The History of Jamaica. Three Volumes. London, 1834.

MINTZ, Sidney W., "The Orgins of the Jamaican Market System." Caribbean Transformations, Baltimore and London: The John Hopkins University Press. 1974.

MUNRO, John L. "The Biology, Ecology, Exploitation and Management of Caribbean Reef Fishes. Part VI. Summary of biological and ecological data pertaining to Caribbean reef fishes." Zoology Department, University of the West Indies, Mona. No. 3. 1974.

---. ed. Caribbean Coral Reef Fishery Resources. Manila: ICLARM. 1983.

---. "The Sea Fisheries of Jamaica". Jamaica Journal. Vol. 3 No. 3, 1969.

MUNRO, John L. and S.T. FAKAHAU. "Monitoring and Management of Coastal Fishery Resources in the South Pacific Region". (mimeo). November 1986.

MUNRO, John L., J D. PARRISH and F.H. TALBOT "The Biological Effects of Intensive Fishing upon Coral Reef Communities" Mimeo, undated.

MUNRO, John L. and Ian R. SMITH. "Management Strategies for Multi-Species Complexes in Artisinal Fisheries". Proceedings of the Gulf and Caribbean Fisheries Institute. 36:127-141 (1984).

MUNRO, John L. and THOMPSON, R. "The Biology, Ecology, Exploitation and Management of Caribbean Reef Fishes. Part II. The Jamaica Fishing Industry, the Area Investigated, and the Objectives and Methodology of the ODA/UWI Fisheries Ecology Research Project". Zoo. Dept., UWI. No. 3. 1973.

NEMBHARD, Beryl. A Report on the 1968 Sample Survey of the Fishing Industry in Jamaica, Statistics and Data Collection Section, Ministry of Agriculture and Fisheries, Jamaica. March 1970.

NICHOLSON, W. and HARTSUIKER, L. "The State of the Fishery Resources of the Pedro Bank and the South Shelf." Selected Papers presented at the Third Working Party on Assessment of Marine Fishery Resources, Kingston, May, 1982. FAO. Fish. Rep. 2789. Suppl: 215-254. 1982.

PRICE, Richard. "Caribbean Fishing and Fishermen: A Historical Sketch." The American Anthropologist, 68 (1966) 6:1363-1379.

RUSSELL, R. "Sample Survey of the Fishing Industry in Jamaica, 1973." Agricultural Planning Unit, Ministry of Agriculture, Jamaica. January 1975.

SAHNEY, A.K. "Sample Survey of the Fishing Industry in Jamaica, 1981." Data Bank and Evaluation Division, MOA. Kingston. 1982.

SMITH, C.L. and TYLER, J.C. "Space Resource Sharing in a Coral Reef Fishery." HELGOL. WISS. MEERES., 24:246-275. 1972.

STEVENSON, D.K. "Management of a Tropical Fish Pot Fishery for Maximum Sustainable Yield". Proceedings of the Gulf and Caribbean Fisheries Institute 30:95-115. 1978.

THOMPSON, Ernest F. The Fisheries of Jamaica. Development and Welfare in the West Indies Bulletin No. 18, Barbados: June 1945.

USSR-Jamaica Fishery Research Project Report. 1980. Ministry of Fisheries of the USSR (ATLANTNIRO), Kallingrad.

VIDAEUS, L. "An Inventory of the Jamaica Fishing Industry." FAO/UNDP Caribbean Fishery Development Project. SF/CAR/REG/180/M9. 1970.

WILLIAMS, Cynric R. A Tour through the Island of Jamaica, from the Western to the Eastern End, in the year 1823. London: Hurst, Chance and Co. 1827.