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**SOCIAL MARGINALITY AND SEA TENURE
IN BRAZILIAN FISHING**

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SOCIAL MARGINALITY AND SEA TENURE IN BRAZILIAN FISHING

I. Paradoxes of Marginal Fishing

Throughout the Latin American tropics are many impoverished fishing peoples who have not made the transition to modernity. Among the poorest of the poor are the fisherfolk or *beirados* (shore dwellers) of southern Bahia in the Brazilian Northeast. Fishermen on this coast still work mainly from sail canoes, using customary lines, nets, traps, and corrals to harvest more than 200 different species of fish and shell fish. They lay claim to extensive fishing grounds in the 1,000-kilometer strip of shallow waters between Salvador and the Abrolhos Banks (Map 1).¹

As large seafood companies, high-tech fleets, export and inter-state markets increasingly dominate both inshore and offshore fishing in most other parts of Brazil, Bahia's traditional small-boat fishermen struggle to maintain control of their local mangrove, estuarine, and coral reef resources and territories. They continue to land over 70 percent of the catch on the southern coast (Silva 1979). Fishing for subsistence or for a small cash or supplemental income has long been a livelihood option for the poor in this region. Today's predominantly black maritime communities developed as successive generations of hinterland plantation laborers lost out in the wider economy, turned to the sea and colonized the littoral zone. Traditional small-scale fishing thus evolved in a context of perpetual poverty and social marginality, but this process was not haphazard. Over time, certain networks of fishermen consolidated control of valuable waterspace and established distinctive customs to allocate fishery access rights. Communities, kin groups, and occasionally individuals within communities fish according to what they hold to be their rights to exclusively appropriate chunks of inshore seaspace. Sea ownership ranges from sequential net-casting claims on migratory species lasting hours or several weeks, to long-term private claims to brackish water spawning grounds, reefs, and net fishing spots defined by the lunar-tide cycle (Cordell 1974).

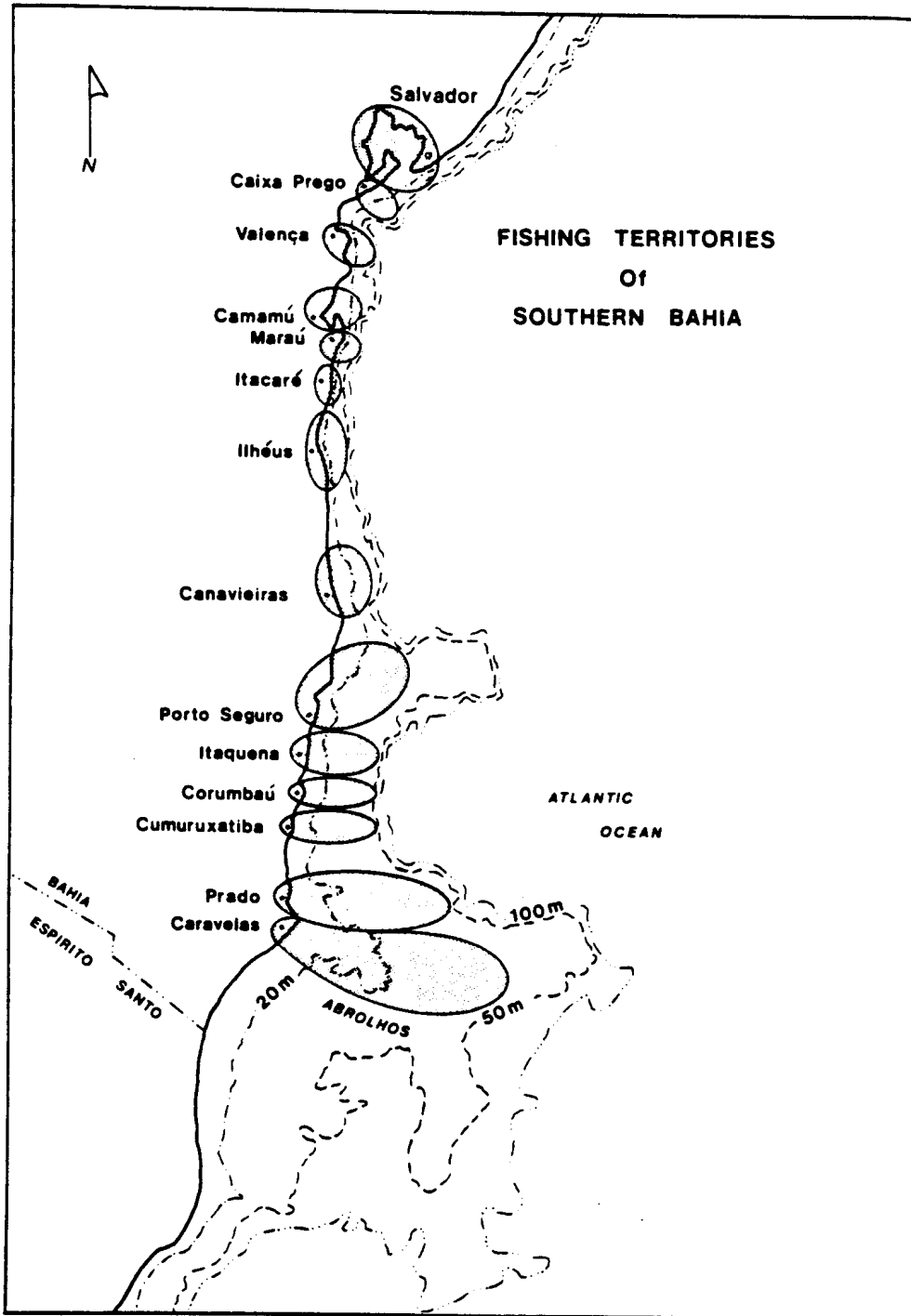
The forms of sea tenure practiced in rural Bahia contradict national fishing codes stipulating that Brazilian territorial waters are common property. Officially, there are

no restrictions on who can and cannot fish inside the 200-mile limit; as long as boats are registered in a Brazilian port, they can move anywhere and take any amount or species of fish. There are virtually no enforceable fisheries regulations. The government simply does not have the capacity to play a significant managerial role in fishing. The fact that Bahian and other similar fisheries in the Northeast exist outside the scope of national fisheries administration raises a critical issue: are marginal rural fishing systems essentially unmanaged? Do local fishermen create what the polemicist Hardin (1968) calls the "tragedy of the commons" — relentless overfishing precipitated by cutthroat competition? Moreover, how does poverty figure into this equation? A sociological premise — widely held — is that deprived and downtrodden Third World populations cannot afford the luxury of natural resource conservation (*World Conservation Strategy*, 1980). Similarly, one well-entrenched "culture of poverty" school of thought on Latin America construes social marginality as a foremost obstacle to any adaptive community organization, stable resource management, etc. (Oberg 1965; Lewis 1952; Varallanos 1962; cf. Pearlman 1973; cf. Lobo 1982). From this perspective, conditions of marginal fishing in Bahia would appear to exacerbate the problem of regulating and protecting the fragile ecology of tropical marine resources.

The complex relationship between marginality and traditional fishing in Bahia is the focus of this study. It explains how life-long marginality as a condition inherent in the region's impermeable class structure recruits people to fishing, shapes their perceptions of the inshore environment, and textures social relations, concepts and informal laws surrounding marine territorial rights.

It is at first difficult to understand how a destitute, politically powerless, fishing population can own large stretches of shoreline sea that Brazilian law upholds as common property. The question arises of how fishermen legitimize their claims in the absence of any supportive formal legal measures outside local communities, and of what happens when traditional claims collide with modern markets and fleets that

Map 1. Fishing Territories of Southern Bahia



penetrate previously isolated fishing grounds. Bahian canoe fishing systems are of special interest in this regard because they reveal a number of hidden strengths and paradoxes of working and living within the confines of marginality. The class society denies fishermen the opportunity to own much on land but allows them to elaborately create, maintain, transfer, and defend fishing rights outside the written law of the sea. These tenure liberties challenge many of the core assumptions of common property theories as they concern the nature of competition, philosophies, and strategies of resource use among impoverished groups and the origins of marine over-exploitation.

It is not, however, out of reverence for tradition, professional commitment or love of the sea that large numbers of fishermen in Bahia are reduced to working from dugouts in modern times, slogging through the mangroves day after day, often with little more to eat than the crab bait left over from their traps and trotlines. Rather, people take refuge in the extensive mangrove swamp fishing environs because they are portions of the inshore sea that no one else wants or has the incentive or stamina to occupy and exploit. Settling the swamps, backwater fishing, and crab scavenging in particular are the ultimate measures of marginality. There is no mobility pathway out of swamp fishing into the Brazilian economic mainstream. The Bahian canoe fishing population has no stable market involvement and at times even its most fallback fishing strategies fail. There is an unmistakable social dropoff at the landward edge of the swamps where a majority of fishermen live. The rural aristocracy has an expression for this disjunction: *"fim de rua é fim de gente"* (where the street ends, so do the people). Seaward beyond this line, people are social outcasts. Thus canoe fishermen symbolize a backwardness Brazil would like to pretend no longer exists. In the Brazilian economic hierarchy fisheries, as a whole, have a low visibility — in 1976 revenue from fishing was 1.31 percent of the gross national product and 2.5 percent of the total agricultural value (Morris 1979). Traditional fishermen, however, with their public image of primitiveness and inefficiency, are often blamed for the low productivity of the industry.

Marginal fishermen in Bahia contribute substantially to the area's internationally acclaimed cuisine, help to sustain the vital tourist industry, and seasonally stock the domestic seafood market with fresh fish. Yet government and the rest of society turns its back on them, refusing to acknowledge either the value of their product and labor or their often sophisticated knowledge of marine life and ecology.

Within local fishing neighborhoods, people go to great lengths to disassociate themselves from the stigma of marginality. In Brazil to be regarded as "marginal" carries overtones not just of dirt poverty but also of lawlessness, sin and violence (Pearlman 1973; Lobo 1982). By no means do fishermen accept this stereotyped upper class perception of their liabilities. Instead they manage to some extent to transform superimposed socioeconomic limits into compensatory freedom of behavior and expression. Within their inshore domain, Bahia's rural fishermen, even those heavily dependent on creditors and middlemen, are their own bosses. They say: *"a vida aqui é difícil, mais liberal"* (life is hard but free). They do not succumb to negativity, but take advantage of the screen of geographic and cultural marginality to work unencumbered by SUDEPE, the fisheries bureaucracy. They are able to avoid purchasing licenses for their boats and gear, paying dues to the corrupt local fishing guilds (*colonias*), and can market a large portion of their fish clandestinely to avoid special docking and municipal fisheries taxes.

This does not mean fishermen can ever totally escape the curse of marginality. They may despair, having to work much of the time on the edge of survival. Families intermittently go hungry and suffer ill health. Households are destabilized. A psychology of chaotic opportunism does surround some slum neighborhoods where it often seems that the only way to rise or make ends meet is at someone else's expense. Many positive adaptations have developed in fishing society, however, that at least partially offset the pressures of scarcity and marginality. Cooperation and reciprocity combat food shortages, help with shelter, medicine, clothing and the constant need to repair and replace fishing equipment. People support each other through

elaborate kin and personal networks both ashore and on the water. The irony of marginality is that, just as it holds the potential to breed economic chaos, widespread suffering and community breakdown, it can foster innovative and adaptive collective action (Lobo 1982; Lomnitz 1977; Pearlman 1973).

In any event, canoe fishing society hardly approaches the state of anarchy and dog-eat-dog competition Hardin envisioned in the marine version of his tragedy of the commons argument (1968). On the contrary, the marginal maritime communities of Bahia amply demonstrate that there is generosity in poverty and fishing, and that not all fishermen are purely selfish and unable to keep from stripping resources beyond renewability. This, however, is an image that is hard to eradicate from the anthropological and bio-economic literature on fishing, much of which still assumes inshore fishermen are by definition common property fishermen and therefore automatic adversaries (Acheson 1981). Even studies that acknowledge the importance of cooperation among fishermen find in it a thorn of exclusive self-interest and self-defense. Thus, Muir (1982) writes of maritime communities:

The fisherman doesn't think he is his brother's keeper. A sense of common responsibility lies below the competitive anarchy of the inshore fishery, but altruism is not the cohesive force.

He further states (1981):

It is worth noting that maritime networks for all their egalitarianism are not based on friendship. Friendship implies an emotional relationship which supersedes economic advantage. You'd give a friend the shirt off your back. That makes a friend an economic liability... maritime networks don't rely on trust or the emotional bonds of friendship.

A long line of anarchy theorists from Malthus to Hardin fail to take into account the powerful currency of reciprocity and cooperation, their mollifying effect on destructive competition, and their potential to

assist in sustaining and regulating renewable resources. Mechanisms of sharing natural resources and pooling social resources in Bahian fishing negate common property fisheries theories that stress that: "every fish you catch is one less for me — that in fishing it's every man for himself, and that because a fisherman cannot prevent others from catching what he leaves behind there is no incentive for self-restraint on fishing pressure" (e.g. Crutchfield 1982; Christy 1964). The economic and social choices open to marginal fishermen are far more complex than any simple dichotomy constructed between altruistic sharing and competitive anarchy. An honor code that fishermen term *respeito* (social respect), intimately linked to reciprocity, shapes and controls interpersonal relations in Bahian fishing. The ethics governing *respeito* are much more encompassing than superficial fishing etiquette, and far more binding on individual conscience and actions than dry paper laws of the sea. In neighborhoods where capital is scarce, *respeito*, specifically as it relates to honoring the debts that arise from reciprocal exchanges among fishermen, is the measure of people's worth. It is impossible to fish for long in a given community without receiving and showing *respeito*. It is primarily in this context and within the larger double-edged framework of marginality that rights to seaspace and fish are established and regulated.

II. Ecology and Ideology of the Purse-Seine Tradition

Fishing with the *calão*, a type of shallow-water purse seine operated by eight-man crews from dugouts six to ten meters long, is the historic focus of the rural maritime economy in the mid-coastal regions of Bahia. It is the lifeblood especially of swamp and estuarine fishing communities. Gifts of fish, income from the catch, and shares taken filter down through neighborhood and village networks. New nets may cost from \$200 to \$700, depending on size, quality, and elaborateness of mesh. Few *calões* are bought brand new. They are usually inherited in various advanced states of use with extensive repairs. Owning such a net is a fisherman's foremost economic aspiration and a marker of high social stand-

ing. The *calão* is finely adapted to catching large schools of estuarine-spawning fish, particularly species of marine catfish (*Tachysurus luniscutis*; *Genidens genidens*). A 200 to 300-meter *calão* typically represents the investment of a fishing captain's life's savings.

A certain quality, almost a mystique, of luck surrounds the use of these large encircling nets. They are thought to be particularly deadly for catfish. Nothing better can happen to a fisherman than bringing in one or more canoes loaded with catfish, greatly prized for its flavor and tenderness. Often a *calão* crew lands several thousand pounds of catfish in a single outing. Often the catch is so large that part of it must be left in a *viveiro* (a makeshift stall set low on the tidal flats to keep fish alive). It is not the prospect of great earnings that makes this type of fishing significant. A good haul of catfish is worth relatively little on the official market, where it is listed as a third-class species. What is important is that a good *calão* catch reaffirms a man's faith that God will continue to send him runs of fish. A captain can take great pride in bestowing these fish on friends and relatives, paying off debts to middlemen, and holding beer-drinking feasts (*botando banca*). A bar floor littered with broken beer bottles at dawn is a sign of a fishing captain celebrating his good fortune and skill. Empty beer bottles are highly valued storage containers in swamp-fishing neighborhoods. To break them is extravagant. Beer is esteemed over the rotgut sugar cane distillate, *cachaça*. *Calão mestres* (captains) and *contra-mestres* (net bosses) drink beer; crew guzzle *cachaça* (cf. Forman 1970). Purse-seining is the occasion for much social drama. It gives people a special opportunity to air their grievances through soapbox oratory, to bestow or withhold favors, to praise or ostracize their companions, and to mobilize participants in social networks. It is naturally conducive to conflict because the stakes are high relative to the catch and earning potential of other techniques. Risks are great because there is often precious little time to deploy and haul a net against the tidal flow and get the fish back to market at peak hours before they spoil (Cordell 1974). In addition, many people may be involved in a single net-

casting sequence (sometimes several crews of eight to ten men each). Fishermen spend many hours debating and analyzing what goes on in *calão* fishing.

What is condensed here of their storytelling and fussing illustrates how seaspace is named, owned, partitioned, and governed by *respeito*, the ethical code, to minimize conflict and equitably to distribute access to premium net-casting locations. These tenure traditions show how the marine environment is conceived of socially and how it can be transformed into property by groups that are otherwise impoverished and powerless. Understanding the forms tenure takes and how it operates on specific grounds depends first on understanding inshore ecology and what forces divide territory into zones.

Purse seining above all must conform to the intricate tidal changes along Bahia's estuaries and creeks that wind back into the mangrove swamps. A system of reckoning tides based on phases of the moon coordinates all fishing activity (Cordell 1974). It enables those most adept at net-casting — the *mestres*, or canoe bosses — to monitor closely the behavior, migratory routes, and life cycles of fish. Because the movement of fish is predictable — they concentrate in certain areas depending on the tide, weather, and other natural cycles — seining operations are markedly specialized in terms of suitable environment. Favorably located waterspace becomes valuable, and net-casting spaces are ranked according to criteria such as ease of access during foul weather, distance from port, past production history, and so on.

Over the history of canoe fishing, the *mestres* have consolidated control over premium waterspace, which has distinctive spatial limitations within the lunar-tide cycle, providing a territorial foundation for the marine tenure system. Fishing grounds range in size from 400 km² to 600 km². Area is restricted by how species are distributed close to shore, by the fact that the sail canoes, even those that are motorized, cannot effectively carry much ice or maneuver at sea, and by the rhythm of markets in local ports and the hinterland, where consumers demand a daily supply of fresh fish.

In the northern portion of the fishery around the port of Valença (Map 2), there are 258 traditional netcasting spots (*pesqueiros*), broken down by season and tide cycles. Because the contours of the estuary are affected by currents, a spring tide in the inner reaches of the fishing grounds is like a neap tide in the outer reaches, and vice versa. The result is that fisherman can use most of their techniques every day, as long as they choose fishing spots appropriate to the day's current regime.

Pesqueiros are the micro-environmental units of fishing. However, each one usually accommodates a range of methods (hand lines, trot lines, set nets, traps, seines). So people using different techniques do not interfere with each other, *pesqueiros* are subdivided into *lanços*, or minimal waterspaces as determined by fortnightly current changes, daily tide-level changes, lighting conditions during different phases of the moon, position of the *lanço* relative to the shore slope, bottom conditions, and the interactions of wind and current. Because of zoning considerations within a *pesqueiro*, *lanços* do not overlap. They also have distinctive names taken from boundary indicators, fishing events, or other characteristics. Names are bestowed by fishing captains who exercise exclusive-use rights and priorities over these tiny chunks of lunar-tide fishing space.

Fishing rights and property exist as spatial points in the context of the lunar calendar. Seining and nearly all canoe fishing moves in a circuit of areas bound cyclically by the tide, which has variable impact along the channels of the estuary and mangrove swamps. At neap tide, fishermen concentrate along the northeastern shores; as the tide begins to rise, they move inward into the main body of the fishing grounds. At spring tide, activity shifts to the southern reaches, and finally, as the tide falls, boats move back up into the main channels.

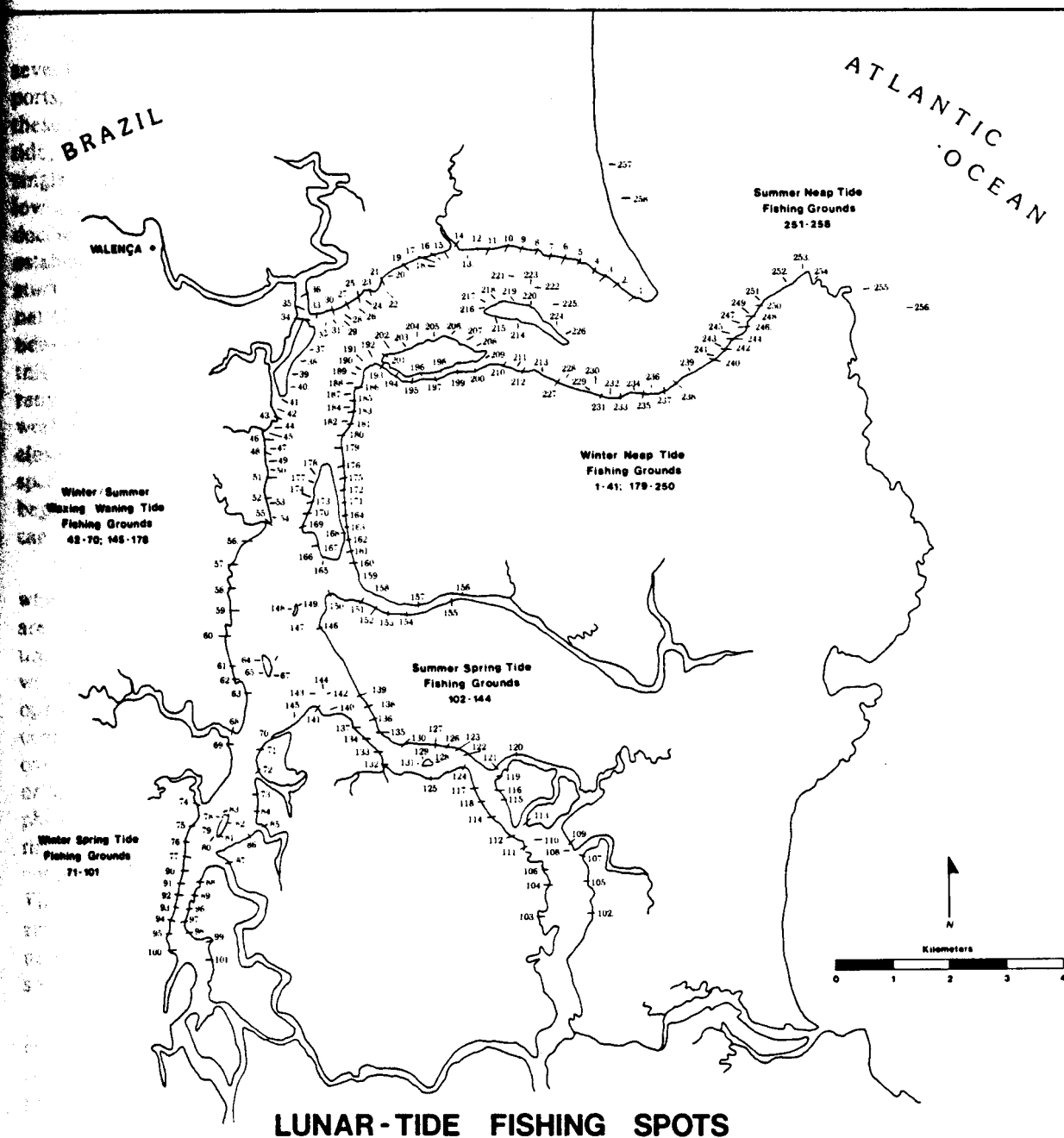
It is impossible to determine with any finality how and when sea tenure evolved in Bahian canoe fishing. Like territorial systems in other tropical small-boat fisheries, it is covert. There are no court records or laws to support fishermen's claims. Yet sea tenure in the form of space controlled by

the community, by individuals, and by social networks has existed over the span of the oldest net bosses' memories, including their knowledge of fishing in previous generations. It is a century-old tradition at the very least.

Knowledge of how to fish under this system is passed on in a limited number of apprenticeships, which can last up to ten or fifteen years. Not all apprentices become proficient net-casting specialists and equipment owners, who inherit rights of access to the most valued fishing grounds. Since fishing spots are stratified by preferred location, the system of sea tenure definitively minimizes conflict in the use of limited waterspace. Marginal areas of the fishing grounds also include areas of essentially unclaimed sea space, where new fishing spots are discovered and staked out from time to time. There is also a series of inter-village buffer zones, where rights are defined loosely, if at all. Yet even in the most marginal waters, special agreements exist for exercising well-ordered, sequential, temporary claims to net-shooting areas.

Although the shore is interrupted by features such as estuaries, swamps, sedimentary reefs, and coral reefs, that are conducive to enclosing seaspace, and although the proximity of fishing grounds affords a high degree of territorial surveillance, these conditions alone do not explain how sea tenure is legitimized. This issue leads away from ecology and into the ideology of resource use — the realm of the social contract and what constitutes "socially acceptable" fishing. A critical feature of traditional sea tenure in Bahia is that fishermen do not have to be physically present to defend their territories or to make them real. People honor each other's claims because of the concept of *respeito*.

Ethical net fishing involves deference as well as honor. *Respeito* is thus created, bestowed, and reaffirmed through sometimes trivial and sometimes substantial acts and gestures of self-sacrifice. The best illustration of the honor code is the way fishermen cope with potential and actual competitive encounters while fishing the intervillage buffer zones. What often happens to create territorial conflict in unclaimed or less-fished waters is the simultaneous arrival of



- | | | | | | |
|--------------------|----------------------|-------------------------|--------------------------|---------------------|------------------------|
| 1 Curral | 44 Guadalupe de Cima | 81 Rio dos Passos | 130 Pádua | 173 Ponta Negra | 216 Ponta do Mangunhão |
| 2 Curral de curral | 45 Rio dos Passos | 82 Atalaia | 131 Funchal | 174 Moura | 217 Atalaia |
| 3 Curral velho | 46 Lanco dos Passos | 83 Boca do Rio Comprido | 132 Boca do Rio Comprido | 175 Ponta do Mangue | 218 A Lapa |
| 4 Curral velho | 47 Cova de São | 84 Rio Comprido | 133 Ponta Grande | 176 Ponta da Saura | 219 Caracó |
| 5 Curral | 48 Cova de São | 85 Tiquaque | 134 Ponta do Engo | 177 Ponta da Pedra | 220 Lanco Estreito |
| 6 Curral | 49 Toca Toca | 86 Piquaque | 135 Ponta de Cima | 178 Lapa | 221 Boca do Canal |
| 7 Curral | 50 Riacho de São | 87 Lanco de São | 136 Toca de Cima | 179 Fudo de Cima | 222 Cova de São |
| 8 Ponta de São | 51 Boca de São | 88 Lanco de São | 137 Cova | 180 Fudo de São | 223 Cova de São |
| 9 Ponta de São | 52 Lanco de São | 89 Lanco de São | 138 Toca de São | 181 Espinheiro | 224 Lanco Vazante |
| 10 Ponta de São | 53 Lanco de São | 90 Lanco de São | 139 Ponta de São | 182 Bateria | 225 Cova Alta |
| 11 Ponta de São | 54 Lanco de São | 91 Ponta de São | 140 Lanco de São | 183 Toca | 226 Ponta de São |
| 12 Ponta de São | 55 Riacho de São | 92 Ponta de São | 141 Ponta de São | 184 Camareira | 227 Ponta de São |
| 13 Ponta de São | 56 Riacho de São | 93 Ponta de São | 142 Ponta de São | 185 Ponta de São | 228 Ponta de São |
| 14 Ponta de São | 57 Ponta de São | 94 Ponta de São | 143 Ponta de São | 186 Ponta de São | 229 Ponta de São |
| 15 Ponta de São | 58 Ponta de São | 95 Ponta de São | 144 Ponta de São | 187 Ponta de São | 230 Ponta de São |
| 16 Ponta de São | 59 Ponta de São | 96 Ponta de São | 145 Ponta de São | 188 Ponta de São | 231 Ponta de São |
| 17 Ponta de São | 60 Ponta de São | 97 Ponta de São | 146 Ponta de São | 189 Ponta de São | 232 Ponta de São |
| 18 Ponta de São | 61 Ponta de São | 98 Ponta de São | 147 Ponta de São | 190 Ponta de São | 233 Ponta de São |
| 19 Ponta de São | 62 Ponta de São | 99 Ponta de São | 148 Ponta de São | 191 Ponta de São | 234 Ponta de São |
| 20 Ponta de São | 63 Ponta de São | 100 Ponta de São | 149 Ponta de São | 192 Ponta de São | 235 Ponta de São |
| 21 Ponta de São | 64 Ponta de São | 101 Ponta de São | 150 Ponta de São | 193 Ponta de São | 236 Ponta de São |
| 22 Ponta de São | 65 Ponta de São | 102 Ponta de São | 151 Ponta de São | 194 Ponta de São | 237 Ponta de São |
| 23 Ponta de São | 66 Ponta de São | 103 Ponta de São | 152 Ponta de São | 195 Ponta de São | 238 Ponta de São |
| 24 Ponta de São | 67 Ponta de São | 104 Ponta de São | 153 Ponta de São | 196 Ponta de São | 239 Ponta de São |
| 25 Ponta de São | 68 Ponta de São | 105 Ponta de São | 154 Ponta de São | 197 Ponta de São | 240 Ponta de São |
| 26 Ponta de São | 69 Ponta de São | 106 Ponta de São | 155 Ponta de São | 198 Ponta de São | 241 Ponta de São |
| 27 Ponta de São | 70 Ponta de São | 107 Ponta de São | 156 Ponta de São | 199 Ponta de São | 242 Ponta de São |
| 28 Ponta de São | 71 Ponta de São | 108 Ponta de São | 157 Ponta de São | 200 Ponta de São | 243 Ponta de São |
| 29 Ponta de São | 72 Ponta de São | 109 Ponta de São | 158 Ponta de São | 201 Ponta de São | 244 Ponta de São |
| 30 Ponta de São | 73 Ponta de São | 110 Ponta de São | 159 Ponta de São | 202 Ponta de São | 245 Ponta de São |
| 31 Ponta de São | 74 Ponta de São | 111 Ponta de São | 160 Ponta de São | 203 Ponta de São | 246 Ponta de São |
| 32 Ponta de São | 75 Ponta de São | 112 Ponta de São | 161 Ponta de São | 204 Ponta de São | 247 Ponta de São |
| 33 Ponta de São | 76 Ponta de São | 113 Ponta de São | 162 Ponta de São | 205 Ponta de São | 248 Ponta de São |
| 34 Ponta de São | 77 Ponta de São | 114 Ponta de São | 163 Ponta de São | 206 Ponta de São | 249 Ponta de São |
| 35 Ponta de São | 78 Ponta de São | 115 Ponta de São | 164 Ponta de São | 207 Ponta de São | 250 Ponta de São |
| 36 Ponta de São | 79 Ponta de São | 116 Ponta de São | 165 Ponta de São | 208 Ponta de São | 251 Ponta de São |
| 37 Ponta de São | 80 Ponta de São | 117 Ponta de São | 166 Ponta de São | 209 Ponta de São | 252 Ponta de São |
| 38 Ponta de São | 81 Ponta de São | 118 Ponta de São | 167 Ponta de São | 210 Ponta de São | 253 Ponta de São |
| 39 Ponta de São | 82 Ponta de São | 119 Ponta de São | 168 Ponta de São | 211 Ponta de São | 254 Ponta de São |
| 40 Ponta de São | 83 Ponta de São | 120 Ponta de São | 169 Ponta de São | 212 Ponta de São | 255 Ponta de São |
| 41 Ponta de São | 84 Ponta de São | 121 Ponta de São | 170 Ponta de São | 213 Ponta de São | 256 Ponta de São |
| 42 Ponta de São | 85 Ponta de São | 122 Ponta de São | 171 Ponta de São | 214 Ponta de São | 257 Ponta de São |
| 43 Ponta de São | 86 Ponta de São | 123 Ponta de São | 172 Ponta de São | 215 Ponta de São | 258 Ponta de São |

several boats, sometimes from different ports, to go after a sizable school of fish. In these situations, because of the limits of the tide, there may only be room and time for a single optimal net cast. If so, net bosses follow a standard procedure of drawing lots to decide who will cast first. Once an order is established, a tide marker, usually a pole stuck in the bank, dictates a sequence of net-shooting rights. Not more than one tide-level change is allowed each boat. On this basis, captains decide whether to remain. Sometimes this queuing pattern works out well, but often a boat will not close its seine and draw in the catch in the specified time. If the next boat in line begins its operations regardless, the two nets can become fouled.

Within a community's fishing grounds, where tenure privileges to lunar-tide space are clear-cut, accidents happen. Although units of net-shooting space have been worked out over generations so boats can operate at a safe distance from one another, occasionally one prime casting space will overlap with another immediately upstream or downstream that belongs to a different phase of the tide cycle. In this case, fishermen may observe spatial boundaries correctly but miscalculate time boundaries. The resulting territorial infringements might appear trivial but nonetheless have the potential to disrupt fishing operations and social relations.

Bahian fishermen take a certain amount of competition and boundary fuzziness for granted. The limits that people will tolerate depend on the extent to which potential competitors are linked by the honor code. Within these limits, which vary between individuals and social networks, people try to get away with whatever scheme will increase their fishing success. Canoes, for instance, have a way of disappearing before a critical fishing expedition and later turning up adrift on the tide. It is not unusual to find a fishing captain buying drinks for a competitor's crew, in hopes of getting them too drunk to leave in the time required to reach a mutually desirable fishing spot.

In any of the above situations, however, where there is a potential conflict over a fishing claim, most captains would rather

act deferentially toward a competitor than force the issue. This increases their respectability, upholds the cooperative ethic, and sets up debts of gratitude to be paid at a later date. As a captain goes out to work borderline fishing grounds, it is especially important to know who can and who cannot be trusted to stay within acceptable bounds of competition.

One additional tactic that minimizes the possibility of competitive encounters is that, when a captain wishes to fish in a particular spot outside the system of lunar-tide property rights, he announces his intention several days in advance at a local bar where fishermen like to congregate. All that is required is for another fisherman to be present as a witness. It is necessary to announce what tide level or series will be used in casting nets. This procedure for staking out territory is called *publicando o lanço* (literally, publicizing one's net-shooting space). To insure the claim, the captain must follow his proclamation by going to the chosen spot the day before fishing to leave a canoe anchored with paddles sticking up in the air. This forewarns competitors that the casting space has been taken. Fishing captains go to considerable lengths to support each other in this routine, which is part of the invisible politics that shore up the entire fishing system.

Failure to cooperate in these practices can be much more devastating for a fisherman than breaking a law. *Respeito* is a cognitive reference point to the community conscience. It influences how fishermen evaluate each other's actions on and off the fishing grounds. It is a yardstick for measuring the justice of individual acts, especially in conflicts. Collective social pressure to conform to the ethics of fishing is reflected in the *olho do povo* (watchfulness of the community's eye), reminiscent of the forceful moral and ethical standard in Palauan fishing expressed in the title of R.E. Johannes' recent book, *Words of the Lagoon* (1981). Reputations rise and fall in terms of the *olho do povo*. The *olho do povo* may find territorial competition in fishing more or less deliberate or accidental, and more or less antagonistic and provocative of counter-action.

Just as the community confers rewards on those who follow *respeito*, it may withdraw the benefits of reciprocity from people who consistently create conflict in fishing. the most severe type of censure occurs when an entire network of fishing captains decide to deny territorial use rights to a troublemaker who does not respect their lunar-tide claims. They can do this in a variety of ways — by sabotaging equipment, competing fiercely for space, or boobytrapping net-casting spaces with rocks and tree trunks. These strategies and withdrawal of cooperation on shore are powerful incentives for renegade fishermen to mend their ways or leave the community.

Shoreside economic necessities continually reinforce cooperation. Marketing fish, obtaining bait, building canoes, borrowing and lending equipment, mending nets and sails, locating crew, and acquiring information on weather and catches create opportunities to perform small favors, building up dependencies for the future exchanges. Some favors up the ante, such as giving tows (*rebocar*), helping someone to string a trotline (*colchar groseira*), or bringing special wood of the white mangrove to form crossbeams for a house. All these exchanges set up comfortable interdependencies that carry over into fishing and make it a distinctly sociable undertaking.

Perhaps the most explicit show of cooperation and *respeito* is made during the peak catfishing season in June and July. Preferable net-fishing spaces at this time are narrow due to tidal fluctuations, maximizing the chance of conflict over waterspace. To relax spatial access codes in the lunar-tide property system during this time, fishermen enter into temporary partnerships (*fazer sociedade*), which are dissolved when the spawning runs subside. This turns out to be a very practical scheme, since catfish are liable to enter the estuary in such large schools that a single boat and crew cannot do justice to the catch possibilities. If the catch is too large to fit into several boats, one crew's net is used to construct a *viveiro* (temporary fish corral) out on the tidal flats. Then, each day following the main catch, it is possible to return to the *viveiro* for more live fish.

Another important occasion for bestowing favors involves marketing fish. Some captains double as fish hawker-gamblers (*pataqueiros*). These people are supposed to be officially licensed by the mayor's office, but there is considerable moonlighting, and it is difficult to bring the activities of *pataqueiros* under the control of the local fish market. Fishermen can always find black market buyers, who usually pay slightly less than the going rate in the official market. But selling fish to a *pataqueiro* enables one to avoid paying a weight and class-specific tax and eliminates the annoyance of going upriver into the market to unload fish. The problem with selling to *pataqueiros* is that they seldom have cash on hand for an on-the-spot transaction. They have a clientele in mind, and they have a fairly good idea of what the demand will be for the fish available. A fisherman, then, may choose to sell to a *pataqueiro* on credit (*fiado*).

A great deal of mutual trust (*confiança*) must accompany such transactions, since *pataqueiros* operate mostly outside the formal marketing system. Selling on credit is a vote of confidence in the *pataqueiro's* reputation. Other fishermen who witness a deal (*acordo*) between a fisherman and his *pataqueiro* provide an audience for the display of *respeito*. When a price is agreed on and a transaction falls through, the *pataqueiro* must cover the loss himself. When this happens, it is even further proof of *respeito* between the parties involved. If the *pataqueiro* fails to fulfill his end of the deal, witnesses to it can usually bring enough pressure to bear by way of censure to extract the amount due.

For Bahian purse-seiners, the ultimate test and strongest demonstration of the cooperative ethic occurs in the context of godparenthood networks, with their rituals and obligations (*compadrio*). The rainy season tapers off in November, ushering in a hot, summery net-casting season and opening up the outermost ocean-beach fishing spots. As boats from ports upriver and in the swamp fan out to the ends of their territories, intervillage conflicts over net-casting space and schools of fish can arise. One strategy to gain access to new territory and to fish safely in waters of an adjoining com-

munity is to become a godparent.

The first step is to arrange to sell a catch to *pataqueiros* in neighboring territories, to make gifts of fish all around, and if the catch is good, to pay for a beer-drinking session. After initially displaying good will, the visiting captain may volunteer to be or be asked to be a godparent to another fisherman's child. These relationships are frequently established after only a brief acquaintance, and a major benefit is to confer summer fishing rights. These ongoing rights may endure for many years, reinforced by other types of cooperation.

Alternatively, a captain planning to fish close to another community's sea-space will arrange to take along a crew member who has a local *compadre* or friend. This is a necessary precaution to ensure that his crew will receive good treatment if they have to go ashore, and to avoid the threat of competition during net-casting sequences. Some people will venture into interstitial areas to fish only when they have a network of *compadres* or actual kin in adjoining villages.

The phenomena of becoming a godparent and establishing networks of contracts to ensure sea rights result in wide-ranging circles of fishermen bound by *respeito*. They are also responsible in part for the cooperative extension of sea tenure within a community. Canoe fishermen, purse-seiners in particular, have huge personal networks with many godparent connections, often running through a series of villages. As a result, acquiring sea rights and securing tenure restore an element of flexibility where waters are otherwise exclusively used and claimed by single villages.

III. Disunity and Keeping the Peace

From time to time, even among the traditional community, competition gets out of hand and escalates into disputes, calling into play a coercive and punitive set of social controls on fishing. Most captains espouse an "eye for an eye, tooth for a tooth" brand of swamp justice. They recognize a danger in letting someone get away with violations of claims or codes and consider it the right of whomever has been

wronged to get back at the violator so no one will become addicted to wrongdoing (*ficar viciado*).

But the backup social controls are also strictly channeled. In cases of serious rifts, certain individuals are called upon as mediators (*aconselheiros*). Were it not for the collective efforts and personal examples set by these key individuals, the cooperative ethic might remain more symbolic than real as a binding force in social relations. *Aconselheiros* are people to be emulated. They epitomize *respeito* in all they do. They are usually retired fishing captains, or in some cases fishermen's widows. These individuals take an active interest in the welfare of the fishing community and are constantly sought out for advice and to exhort fishermen to maintain *respeito* in times of controversy.

Although violations of private fishing space are a common feature of disputes, they are seldom the root cause. Fishermen engaged in this type of conflict carry hostilities not traceable to isolated events, but histories involving many people. *Aconselheiros* must be able to comprehend and soothe social relationships that have fluctuated over a long period of time. A dispute is thought of as a state of disunion (*desunião*), which has a characteristic form and moves through distinctive phases. Prolonged disputes, reaching across several generations and marked by revengeful acts (*vingança*) and general hostility between groups of fishermen, their families and friends, resemble the Appalachian "feud." In the course of a dispute, new conflicts are added to a past history of grievance.

Most fishermen's disputes begin with rifts onshore and carry over into fishing, with its peculiar competition. Reworked in this context, some disagreements develop in which contesting captains try to claim each other's fishing spots by force. When claims are violated, the victims can take a wide range of retaliatory action — poaching, theft of equipment, sinking of canoes, and booby-trapping of fishing spots with jagged tree trunks and boulders capable of ripping an intruder's net to shreds.

In most cases, fishermen involved in disputes not only feel justified in such acts of reprisal, but consider themselves immune

from punishment by police in nearby towns. At the request of the local sheriff, civil disorders are usually handled by state military police who have garrisons in the major seaports along the southern coast. Fishermen see little threat from these authorities, however, because they contend that their swamp neighborhoods are outside the jurisdiction of the state and local townships. They believe that their homes and fishing grounds come under the control of the *Marinha* (Brazilian navy). Therefore, whatever happens in the context of fishing must come under "federal" jurisdiction.

Under Brazilian law, there is in fact such a separation in authority over land and sea, and the navy historically has been the central figure in regulating fishermen's activities and registration in professional organizations. But most of these regulations never penetrate the mangrove swamps, and fishermen have little real perception of or experience with the powers of various naval authorities. Their only contacts in this regard are indifferent *capatazes* (local port captains), who leave fishermen to settle their own affairs. This *laissez-faire* situation underscores the predominantly marginal character of traditional swamp fishing in terms of modern Brazilian legalities and politics.

Because of their peripheral social status and dissociation from government, fishermen have developed the idea that they cannot be prosecuted on land for illegal acts committed in fishing. A fisherman charged with a serious crime will flee to the recesses of the swamp until things blow over, because he will be on "federal" territory and supposedly safe from prosecution.

Fishermen know how to exploit their marginality. Taking advantage of the fact that national political and legal authority is thinly spread throughout the rural coastal fishing areas, they attempt to play land and sea officials against each other. Since they do not consider crime at sea directly translatable to the domain of land authorities, fishermen feel freer to engage in conflict in their work than on land. Accordingly, fishermen exercise their own brand of "bush" justice (*vingança*) in the course of disputes, most of which are ultimately a response to harmful acts committed on

shore.

Disputes over fishing claims frequently result from family quarrels (infidelity, wife-beating, disagreement over inheritance of *bens* [assets such as a house or fishing equipment]). To take a fishing spot by force in reprisal for a wrong-doing, a fisherman must feel a psychological precondition often described as a state of mixed anger and shock (*pessoa fica apavorada*). Once a confrontation occurs on the fishing grounds, especially if anyone is physically hurt, much drama in the fishing neighborhoods is bound to follow, involving public exchanges of threats, counter-threats, and hell-raising (*barulho*), which feeds back into subsequent fishing trips.

There is only one way to end a state of disunion among fishing captains, crews, and families, and to restore good relations once grievances have escalated to violent confrontations: the affair must be brought before an *aconselheiro*. One of them may be asked to intervene at an early stage; but for the efforts to be successful, the combatants have to want to air their grievances. Although the primary aim of the *aconselheiro* is to promote reconciliation, to do this he or she must invoke *respeito*, the cooperative ethic, as it is reflected in the *olho do povo* (the sense of community justice), and bring it to bear on individual consciences.

Thus, the way out of a dispute is not to fix blame — a clouded issue at best — and then punish the wrongdoer, but to negotiate reunion by appealing to the community sense of fair play. The aim is to restore equality. A simple face-saving gesture (an *obertura*) by either one of the parties will suffice for openers. This involves humbling oneself (*se humilhar*) and showing that one no longer wishes to carry a grudge (*carrega mágua*). If successful, this strategy will lead to an exchange of favors or kindness (*troca de fineza*). The conciliatory gesture need not be large. It may consist of a gift, perhaps a fish or a tow in from fishing in bad weather, which might otherwise not seem significant. The main point, however, is for people to begin to re-establish *respeito*. Through the exchange of just such small favors, fishermen are frequently able to come to terms and renew cooperative rela-

tions, reaffirming the value of personal deference in avoiding waterspace challenges.

IV. Network Regulation of Fishing

Fishing in poverty and along ocean shorelines need not pose insurmountable obstacles for social control and resource management among traditional maritime peoples. Bahian customary sea tenure is an example of how an encompassing, unofficial "law of the sea" can be engineered out of marginality: there the desire is to own a clump of turf, but with that possibility sealed off by a rigid class system people settle for owning a chunk of waterspace. In a nearly three hundred year history, fishermen have collided many times over claims to waterspace, but they have eventually come to agree on the distribution and dispensation of sea rights.

The importance of people's egalitarian personal networks as an adaptation both to the exigencies of lunar-tide fishing and of marginality cannot be overemphasized. In coastal Bahia, where there are so few employment opportunities for the poor, a system of sea rights, however unofficial, becomes significant economically. Because fishermen are rarely able to qualify for any sort of national security or retirement benefits, people must invest in kinship and personal obligations as security in old age, infirmity, and other occasions of vulnerability. The reciprocal obligations among captains and between captains and apprentices are a kind of personal insurance.

Like the coastal tropical forest in which each tall tree supports a multitude of vines and other smaller plants, the fishing neighborhoods are characterized by a high ratio of dependents to breadwinners. Moreover, the responsibilities for providing food, care, clothing, and shelter, and for socializing children are commonly spread over a series of households. Although the nuclear family remains the common dwelling unit, precarious balances of changing fortunes lead to a fluid pattern of friendship and co-residence. Kinship is a motivation for people to remain attached, but it carries no guarantee of permanence.

Against this background of people clustering around anyone who can provide

for them, men's social networks take precedence over domestic units and the family as the most basic unit of socioeconomic organization in the fishing villages. Within these networks, men rely on each other for favors to sustain their livelihood. They are open at every moment to the possibilities of exploiting personal relationships, but they do so with great finesse, spontaneity, and genuine affection. In doing so, they become artists at being personable and charming (in Brazil this is sometimes called *jeito*, holding others in the spell of one's personality, even if momentarily, with elaborate subtleties of bravado, ingratiation, and praise). Though these enticing qualities of social interaction are by no means uniquely Brazilian or linked to marginality, they clearly provide a texture to fishermen's activities and behavior with their network of contacts.

In the swamp communities of Bahia, the visitor is struck by the ritualistic aspects of marine ownership. The whole system of sea rights is shored up by a kind of fantasy made possible by surrendering to the hopelessness of poverty and sociopolitical isolation. Extending sea rights in the context of godparenthood relations, resolving disputes through deferential acts that enhance one's reputation, extravagant beer drinking contests that exhaust a fishing captain's scanty earnings while boosting morale — all these events unfold with a curious staged quality.

Reputation-enhancing acts such as "becoming humble" in the etiquette of personal deference, which indirectly and cumulatively help to control competition in fishing, are behavior borrowed, perhaps, from stratified interaction in the race and class system and put into a different context in the social drama of fishing. Poor people, most of whom occupy the darker ends of the racial spectrum in Brazil, are obliged to show proper humility to gain what patronage they can from the rich. In any case, fishermen often adopt and perfect these patron-client roles to their own ends and within their own hierarchies. In a similar vein, fishing captains refer to each other as "*mes-tres*," a term befitting the captain of a merchant ship or naval vessel but curiously out of place among fishermen who live in slums and fish from dugouts. These behaviors both imitate and mock the rich. In this

spirit of sarcastic humor, a fisherman flanked by huge coconut plantations with a sweeping gesture toward the mangrove swamp proclaimed: "*essa fazenda é minha*" (this is my plantation).

By making these comments, I do not suggest that sea tenure is an escape from underlying social fragmentation and atomistic competition into fantasy and display. Rather, I stress how complex this crucial institution is, and how embedded it is in the culture, legitimized through reciprocity. It defers the "tragedy of the commons" and illustrates that what has been all too casually deemed self-regulation in small-scale fishing (e.g., Acheson 1981) is actually a subterranean economic system that overflows into almost every facet of social life. While the concept of self-regulation may be plausible and meaningful in the context of general systems theory (McCay 1978), it is too socially and politically nebulous to explain who and what does the regulating in the fishing community, and what the cohesive forces are. In cybernetic terms, a true self-regulated fishery presumes that fishermen know both the limits of their resources and the impact of their equipment on resource availability, and furthermore that they have the ability to monitor their rates of exploitation to keep from exhausting fish stocks. It is doubtful there is any traditional fishing system, anywhere, that would qualify under this definition, although fishing captains are hardly ecologically naive.

Elsewhere I have shown that captains possess various means to gauge how much their production system can expand safely (Cordell 1977). Perceptions of what constitutes a "safe" number of people on fishing grounds, however, are primarily based on acceptable levels of boat crowding rather than on estimates of reproductive reserves of fish necessary to sustain certain levels of production.

There is, then, a locus of management in the purse-seine tradition, but it is socially diffuse and does not involve decisions by a controlling group or individual. The configuration of territorial ownership itself is not what controls fishing, either. Rather, it is the special cooperative relationships fishermen develop with one another. Sea tenure is an extension, almost an epi-

phenomenon of these personal networks. Bahian fishing culture is like a lake with many inlets that contribute to a pool of opportunities for cooperation and reciprocity. Each source is relied upon to provide new affirmation and elaboration of the previously established ethic of *respeito*.

Researchers have now attributed any number of ecological effects to traditional sea tenure without saying what it really is, apart from subdivision and claims to fishing space close to the shore (e.g. Acheson 1972). To date, we have precious few accounts of how areas of formerly tenureless or common fisheries are acquired for exclusive ownership, or how people lose rights in a fishery. Although it is becoming clear that most sea-tenure systems help control access to fishing space (c.f. Stiles 1976) without directly managing resources, even these access-management functions remain obscure. Previous interpretations have been far too mechanical and narrow, and this is one of the reasons an indeterminate quality surrounds the issue of self-management as other writers have defined it.

Part of the problem, however, is that sea tenure and the way it works is so closely allied with different aspects of ideology in social relations that it verges on the intangible.

Often the dimensions of sea tenure become evident only during periods of cut-throat competition, when fishing claims are hotly disputed. This was the situation when my fieldwork began in Bahia in 1970. Hundreds of monofilament-nylon gill nets and seines were brought in by entrepreneurs and used in traditional fishing territories. This project had the blessing of the national fisheries agency (SUDEPE), which helped secure loans and tax incentives for outside investors in the country's so-called backward fisheries. No amount of secrecy concerning the location of fishing spots, which Forman once posited as the chief mode of territorial defense open to groups of raft fishermen elsewhere in the Northeast, could forestall this challenge to local canoe-fishing rights. Ultimately, modernization failed because competition escalated and because some stocks native to the local estuaries and reefs were temporarily overfished (Cordell 1978). The system of egalitarian reciprocity did not

mesh with affluent strangers bearing nylon nets.

The sequence of events in Bahia's fishery innovations reveals an understated yet fundamental principle of traditional sea rights — they are primarily an "in group" phenomenon, deriving validity partly from what Hardin (1968), interestingly enough, envisioned as the management cure for the commons — "mutually agreed upon coercion." Characteristically, he zeroed in on the negative side of the equation, possible sanction through coercion or force, but missed the positive side — willing cooperation with the considerable rewards of reciprocity. He also implied that both these forms of social control have to be manufactured by new policies, institutions, protective agencies, and the like. This perspective overlooks the many living examples of successful informal management within both traditional and modern societies.

Knowing how fishermen are socialized in *respeito* (and how comparable cooperative codes function in other traditional societies) is a key to understanding how sea tenure works without more overt controls or government intervention. However, the fact that tenure is only legitimized by these internal means also suggests how easily it may be subverted by market expansion and fishery modernization, which cannot be controlled within the nebulous confines of national "common property" fishery codes and conditions. All that is required to shatter the sea-tenure balance is for an external power to establish domain, or for a local enclave to form around competitive technology. Then, in either case, there is little to be gained through cooperative fishing or respect of traditional authority and autonomy.

V. Development Stresses on the Tenure System

Historic spatial and cultural isolation has allowed Bahia's inshore sea tenure traditions to endure largely without interference from national fishery regulations or antagonistic economies. As this isolation breaks down, however, traditional fishermen find themselves trapped inside national common-property laws and competitive conditions that open up their territories to

external exploitation. They become vulnerable to territorial displacement, loss of sea rights, and resource "piracy." As long as their tropical home-waters are treated by the Brazilian government as common property, struggles over sea rights will intensify because of the inherent opposition between fishermen's hidden laws and outsiders' appropriation of sea territory.

Collectively defensible sea territories that only local fishermen know how to work safely and productively on a sustained basis help to ward off takeovers by outsiders. Left to their own devices, local men can effectively enforce their territorial claims against competitors of similar economic means. But they cannot cope indefinitely with entrepreneurs who have more capital and with non-resident vessels that have no respect for local customs and no need to cooperate. Thus, major parts of the traditional sea-tenure system described so far already exist only in history. The small-boat fisherman of Bahia today face cutthroat competition from all sides and economic warfare from within. Valuable local fisheries with natural spatial and biological limits have become flooded with inappropriate gear and non-resident boats. Destructive technological competition has begun between locals and outsiders and among local factions. Short-term speculation and overcapitalization have doomed otherwise stable and productive traditional economies to sudden overfishing.

In previous writing (Cordell 1973; 1978), I documented the complex series of debilitating changes in canoe-fishing society and ecology that occurred after nylon fishing gear was introduced. These observations were confined largely to the fisheries of the Valença Delta (see Map 1). Since then, conditions have worsened there and along the southern coast of Bahia, as far as the Abrolhos. Now local fishermen and fisheries are extremely threatened both by vessels with sophisticated gear and by related commercial expansion.

Uncontrolled exploitation of land and sea resources in the coastal zone has reached a critical intensity. Over the past fifteen years, investors and economic planners have focused on the southern shore from every conceivable angle — oil exploration, ship-

building, tourism, lumber, agriculture, fisheries, aquaculture, mining, and heavy-metal processing. New roads have been built into the region, making it accessible from the large urban centers of southern Brazil and the state capital, Salvador. The area still looks like a frontier; rubber, cacao, piassava, clove, and cinnamon plantations still abound, and tropical hardwoods are still being cut from the country's last major stands of eastern rainforest. A similar juxtaposition of heavily exploited habitats grading into isolated areas also characterizes the region's shallow-water, small-scale fisheries.

For the past twenty five years, Brazil has single-mindedly pursued unrestricted fishery development, with all manner of fiscal incentives favoring entrepreneurs. *Decreto-Lei* 221/67 provided tax exemption of from 25 percent to 75 percent on personal income invested in fishing; it suspended import tariffs on fisheries technology and craft; and it suspended federal taxes on catches destined for both internal and export seafood markets. These incentives remain in effect at this writing and will probably be prolonged despite the fact that catches are nosediving in major export fisheries.² Although Bahia was not part of the national tax-incentive scheme that has encouraged local overfishing in other states, there is evidence of overfishing in Bahia. Interstate seafood markets and large-scale fishery interests whose production has bottomed out in other parts of the country are now concentrating in earnest on Bahia's remaining inshore stocks. The reef and bottomfish of the Abrolhos are especially attractive and are now being exploited by the tuna fleets based in Rio de Janeiro and by *caciqueiros*, large mother ships from Rio and Vitória that each send out up to fifty dories to work the banks.

Fishing effort is not spread uniformly along this coast. The greatest exploitation has been near the major cities and near shore. A critical area of actual and potential overfishing extends from the landward range of mangrove swamps out to a depth of fifty meters, touching the outer slopes of coral and sedimentary reefs. In Brazil this depth range roughly corresponds to the limits of inshore fishing gear.

Two of the most visible pressures on inshore species are the use of monofilament nylon nets, introduced in the mid-1960's primarily for gillnetting, and the "pirating" of fish by outside trawlers and longliners in the customary territories of traditional fishermen. Accumulating evidence shows that the unmanaged use of nylon fishing gear, especially gillnets, beach seines, and small-mesh nets used to block the mouths of tidal creeks, has massive negative impacts on marine species. Even so, nylon gill nets are now used extensively in long swaths parallel to the shore. Traditional fisherman are tending to shift from traditional gear to the money making *arrastão* — dragging nylon nets with wingboards for shrimp from small sailboats (*saveirinhos*). Equipping canoes with outboards and motorizing sailboats has made it possible for a single vessel to set several kilometers of nylon nets along the shore. This blockade effect reduces the catches of traditional gear set closer in and perhaps adversely affects spawning runs of some species. Traditional fishermen say nylon indiscriminately kills a wide range of fish and seabirds while interfering with other types of gear. They say one can always tell where nylon is being used because of the profusion of dead fish floating in the water. Consumers say nylon-gillnetting fish taste bad because they have often been dead in the water some time before being landed. More extensive habitat studies are required to confirm these claims.

There has been a continuous escalation of trawling in water between twenty and fifty meters deep. Large power boats with tiny meshed seines for shrimp kill many other demersal species. In general, modern methods of trolling and trawling interfere with the operation of traditional inshore gear. Particularly during spawning runs, they compete for the same spots and species. Trawlers from Conceição da Barra and Vitória in the State of Espírito Santo frequent the Abrolhos area, sweeping the shrimp banks and irreparably damaging the set gear of small-scale fishermen.

Shoreside fish populations are thus selectively subject to doubled pressure from both offshore and inshore fleets, traditional and modern. Additional impacts on coastal fishery resources that are still difficult to

quantify are: stepped-up drilling and exploration by the Brazilian oil company, PETROBRAS; biocide runoff from the littoral zone plantations; rapid colonization of the southern coast; landfill for highways and hotels; bauxite mining; and wide-scale extraction of coral for *cal*, lime manufacture. Dynamite is heavily employed in this mining process, and according to coral-reef specialist Laborel (1969), who worked in Bahia, the Itaparica reefs in Salvador Bay were practically dead by 1969, due to extraction of lime-rich deposits.

In recent years fish prices across the board have skyrocketed as local waters have become unable to supply the major seafood markets in Salvador and Ilheus. These markets must now reach all the way to Vitória and Aracajú in adjacent states to obtain relatively fresh fish. Meanwhile, large vessels from the states of Pernambuco, Alagoas, Rio Grande do Norte, and Espírito Santo are converging on the marginal fishing grounds of Bahia. They return to their home ports to sell the catch, so Bahia actually ends up buying back from seafood companies in adjoining states, at an elevated price, the fish caught in its own waters. In the past year the price of first-class species such as snapper and shrimp has risen 105 percent, the most of all items in the cost-of-living index. Some previously rich estuaries such as the Valença Delta are now fished so heavily by outsiders that the only marine products available in local markets are frozen *corvina* trucked across 2000 kilometers from São Paulo, salt cod imported from Nova Scotia, and canned tuna from Alaska.

In Valença and other southern ports, excessive netting of major commercial varieties of finfish has produced a spillover effect on shellfish. Many local fishermen work the mangrove shellfish habitats, and migrants to and from cities often settle in the swamp areas to scavenge. More and more fishermen who conventionally work in the estuaries and farther offshore with large encircling and dragged nets have had to turn to the swamp to survive. Recent studies indicate that the intensity of foraging for some molluscs and crustacea exceeds the carrying capacity (Cordell 1973; Blanco 1978). Near Valença, swamp-fishing settle-

ments must be frequently shifted to achieve a satisfactory ratio of work to production from shellfish-collecting ranges.

As early as 1970, nylon nets were competing with traditional gear for identical species and waterspace. The competition has altered the distribution of equipment in Valença and the concentration of ownership in the different categories represented. Table 1 indicates a tendency for traditional nets to be abandoned in favor of secondary methods, such as mobile trotlines and fish corrals, which have a fixed seasonal location and an uncontested private tenure status. By far the greatest reduction of gear was in the category of traditional natural-fiber nets. Overall net fishing has been continually dwindling since 1970; but traditional purse-seining, which is remarkably well adapted to estuarine fishing and to the social organization and redistributive food networks of poorer neighborhoods, is making a slight comeback.

The selective introduction of nylon leaves part of the delta fishing community with traditional technology and values while providing ephemeral mobility to the other part. Part of the fishing community has switched its economic dependence from the traditional power base of captains and middlemen to factory bosses, wealthy merchants, and speculators from the Salvador fish and grain markets. This new power base purchases nylon gear and canoes for a small segment of townspeople, some of whom have little or no fishing experience but are desperate enough to work at fishing for fixed wages near the starvation level. Traditional captains have to be conservative with their equipment (usually representing a lifetime's investment), unlike their competitors with nylon, who can afford to precipitate spatial conflict that destroys gear. The chaotic expansion of a nylon-outfitted fishing enclave in the narrow corridor of brackish water between land and sea marks the end of an era in which marginality was the small-scale fisherman's defense against encroachment and overexploitation of the fish.

Today in Brazil there is unprecedented capital available to expand interstate seafood markets, and developers are reaching out with advanced technology to capture even

TABLE 1. Changes in fishing Specialization 1965-1982 (Valenca neighborhoods—does not include outlying delta and island communities)

		Distribution of Equipment				net change since 1965
		1965*	1970	1976	1982**	
Nylon Nets	Beach Seine	30	54	47	6	-24
	Gill Net	230	398	280	144	-86
Traditional Cotton Nets	Purse Seine	75	64	39	49	-26
	Dragged Net	250	186	126	113	-137
	Gill Net	90	71	13	0	-90
Secondary Methods	Trot Lines	100	-140	-180	-225	+125
	Traps	150	-200	-150	-90	-60
	Fish Corrals	70	92	62	146	+76

* 1965 figures are a reconstruction from interviews with owners and are therefore rough approximations.

** Figures do not reflect the wide adoption of nylon shrimp trawls in 1981 and 1982.

the most residual supplies of fish and shellfish, which the coastal poor have always fallen back on for subsistence in times of scarcity. It is not technical innovation *per se* that is destructive, but the way in which change proceeds, disrupting customary sea tenure and removing the informal spatial and political autonomy local groups need to fish sustainably and without conflict. As Bahia's new absentee sealords, bosses, and speculators divert badly needed local food supplies to elite urban and foreign markets, the paramount questions become: who has rights to the inshore sea, and how should these rights be allocated to conserve marine resources?

Unprecedented fishery expansion unveils the true colors of common property as a national fishing code. In Bahia, the code is being manipulated by financial interests not themselves dependent on fishing, and the effect is to deny poor people access to their traditional fishing grounds. Escalating conflict in Bahia's fisheries demonstrates that the real "tragedy of the commons" is the chaos following the breakdown of traditional sea tenure.

VI. Conclusions

The collision of traditional and modern fishing systems is not merely technological. It involves many different converging, antagonistic groups and interests, each bent on unilateral appropriation of sea space and resources, each facilitated by common-property laws and conditions. The extent to which small-scale fishermen reach out to claim the sea and the dimensions of their tenure customs are finally emerging as territorial conflicts intensify. Inshore sea rights, taken for granted or never consciously debated in post-colonial eras, have now become controversial and valuable.

If Brazil and other tropical countries are to begin serious long-range management of their marine resources, they must be prepared to take into account a wide range of customary rights and claims to the sea, many of which were never officially thought to exist. The real managerial strengths in Third World coastal fisheries are indigenous. The foregoing discussion explains some of the ways rural communities territorially regulate fishing activities. The power they have to do this is not vested in the state or its bureaucracies, but in their own informal institutions, norms, and cooperative organizations.

Traditional sea rights and sea tenure practices are hard to defend, however, because they are hard to define outside of a total social context. In Bahia, fishermen's highly developed, culturally-shared sense of marine property cannot be mechanically legislated. The pattern of fishing territories could conceivably be mapped and legalized, but only the ideology of sea rights, consensual agreements, and reciprocities — the tradition of *respeito* — make the territorial system work.

It is difficult to convince fishery authorities that traditional informal sea ownership even exists in places like Bahia, much less that it is worth preserving. Fishermen's laws are non-technical and, admittedly, somewhat unintelligible to the uninitiated. Sea tenure is a kind of invisible wealth, created and maintained for both material and non-material ends. But patterns of sea tenure concealed beneath the ragged, impoverished exterior of Bahia's swamp-fishing communities embody logical and proven solutions to problems of managing the fishery. In a traditional context, they minimize conflict and

ease fishing pressure by limiting the number of people and types of boats and gear that can fish compatibly in fixed territories close to the shore. Together with fishermen's extensive ecological knowledge of the sea, the tenure arrangements are valuable resources in themselves, worthy of some type of formal protection.

Fishing is one of the few economic alternatives left to the coastal poor in Bahia and other parts of northeastern Brazil. Establishing rights to the sea through unwritten laws helps local fishermen transcend the absurdity of being born "marginal." Sea rights, in place of land rights that seem forever beyond their reach, give fishermen a positive identity, some sense of security, and a chance to own something in the highly class-stratified society of the Northeast. Sometimes the fishermen's world goes mad with scarcity and oppression. Yet, paradoxically, the marginality that breeds their poverty also allows people the independence to invest and speak boldly of their sea rights, and sometimes to sing like birds and dance as they walk.

Notes

1. The Brazilian Abrolhos Archipelago is located near the southern tip of Bahia between latitudes 17° 20'S, and 18° 10'S. Local people attribute the name to a contraction of the cautionary phrase used by Portuguese navigators: "Abre os olhos" or "open your eyes." They are among the least studied corals in the world (R. E. Johannes, personal communication). The Abrolhos was once an important whaling station. It includes volcanic islands and adjacent scattered coral reefs, the southernmost corals in the southwest Atlantic. The reefs form two arcs which occupy a total area of approximately 6,00 km². The basic element of most of the reefs are *chapeirões*, mushroom-shaped pinnacles, 5-25 meters high and 5-30 meters in diameter. Because of their unique biological characteristics, stunning physical beauty and proximity to the Brazilian coast, the Brazilian government in April 1983 declared a small portion of the region (the Timbebas Reefs, Santa Barbara Island, and Parcel dos Abrolhos) a national marine park. Because these reefs are so different from those of the rest of the Atlantic they deserve much more attention from the scientific community outside Brazil. Darwin first visited the area during the voyage of the *Beagle* in 1832. Later geologists Hartt (1865) and Branner (1904) provided some of the earliest reef descriptions. Laborel during 1961 and 1969 *Calypso* expeditions undertook more detailed studies. Recent selected readings are: Laborel (1969); Leao (1982); Nunan (1979), and Joly et. al. (1969).

2. Falling catches are illustrated by changes in shrimp and several other major species. With one of the most extensive coasts in the world (nearly 8000 kilometers), and a favored climate, Brazil ranks among the ten largest shrimp producing countries. However, the total shrimp harvest which reached a high of 129,000 tons in 1972 had decreased to 79,000 tons in 1979 (SUDEPE/PDP 1980). Exports rose very little in this period — from 6,783 to 7,172 tons. During this time per capita consumption decreased from 0.506 kg. to 0.197 kg. (JART 1982) due to steep increases in the price of shrimp on the domestic market. Overall, catches in Brazil rose from 280,000 tons in 1960 to 816,000 tons in 1974 (*Anuário Estatístico do Brasil* 1976: 158). This growth was largely spurred by tax incentives (Silva 1979: 28-43). Between 1974 and 1979 the total catch only increased from 816,000-858,000 tons (*Anuário Estatístico do Brasil* 1981: 354-355), indicating a nation-wide levelling-off of production. Among the five principal species caught — tuna, corvina, shrimp, lobster, and sardines, from 1979 up to the present all are in a state of decline (Nascimento 1982). The Rio tuna fleet, after an initial period of profitable fishing (1976-1979) in which tuna in the export column shot up from 3-46 percent (tuna are mostly sold in Europe), tuna are disappearing and leading to deleterious change in the sardine (tuna bait) fishery as well (Nascimento 1982). A number of sardine canneries have gone bankrupt. Meanwhile the southern-based tuna fleets are targeting on the resources of Abrolhos which look like virgin fisheries compared to the Rio coast. There is every indication they will repeat the "tuna story" in Bahia without some type of territorial regulation. At the rate it is going, it is doubtful Brazil can look to fisheries exports to help reduce the external debt which recently passed the \$80 billion mark.

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