NUPAUB – Núcleo de Apoio à Pesquisa sobre Populações Humanas e Áreas Úmidas Brasileiras – USP
Center for Research on Human Population and Wetlands in Brazil – USP

MARITIME ANTHROPOLOGY IN BRAZIL

ANTÔNIO CARLOS DIEGUES (ED.)

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SUMMARY

INTRODUCTION

In the last decades, coastal issues have become a matter of concern both for academics and development practitioners. During this period the Brazilian coast and adjacent waters, even in remote areas of the Northeast and of suffered from increasing pollution and degradation, due to a rapid industrialization, urbanization, deforestation and over fishing. Coastal communities, particularly those of artisanal fishermen, that were geographically and socially isolated in the past, also became important social actors in this process. In most cases, the beaches where they lived were expropriated by land speculators, for sale to tourists.

In the mid 1970's, some of these communities and small-scale fishermen organizations started reacting against land expropriation and over fishing by industrial fishing boats that threatened their livelihood. At the same time, increasing pollution of the rivers and estuaries, particularly in the Northeast threatened important ecosystems on which artisanal fishermen depend for their livelihood. Later, this social reaction was backed by progressive sectors of the Catholic Church and Unions, during the period of re-democratization of the country, following twenty years of military dictatorship. In some regions, these fishermen obtained a high social visibility and were able to create new democratic institutions to counteract those controlled by local oligarchies.

This process generated a growing interest by researchers to analyse these complex changes. It became clear that the methodology used by the social sciences to study social processes in rural areas was not appropriate to tackle the changing ecological and social relationships between society and the marine environment. Some of these researchers, particularly anthropologists, started claiming the need to establish a new and specific field or sub-discipline within Social Anthropology to deal with the complex relationships between man and marine ecosystems, called Marine Socio-Anthropology.

This Reader is an attempt to give an overall and interdisciplinary view of the research in different fields of the social sciences undertaken by several Brazilian universities aiming to analyse the processes of social change in coastal communities, particularly those of artisanal fishermen. It is a result of papers presented at a series of national workshops called "Social Sciences and the Sea", organized by NUPAUB-Research Center on Human Population and Wetlands, of the University of São Paulo, from 1988 to 1991.

ARTISANAL FISHERIES IN BRAZIL

Antonio Carlos Diegues

Introduction

The interest in artisanal fishing has increased of late, both in governmental as well as academic bodies, for many reasons. Among those worth mentioning are: the little success that the governmental policy for the development of the fisheries sector in Brazil has enjoyed, focusing as it does, almost exclusively on industrial fisheries; the growing recognition of the importance of artisanal fish workers who, even without the government's help, continue to supply the local and regional markets with their yield; the innumerable pressures that the artisanal fish worker communities have been suffering of late, owing to the expansion of the interests of the real-estate and tourism sector and environmental degradation, factors which many a time forces the artisanal fishermen to move to cities, having lost their land; the coverage given to these conflicts by the press; the recent political liberalisation in Brazil, after the fall of the military regime (1964 to 1984) which allowed the exploited and forgotten groups of society to express themselves more freely, especially in defense of their rights and aspirations in the Constituent National Assembly; the work carried out by non-governmental organisations, in particular, the Catholic Church, through the activities of the Pastoral da Pesca, mainly in the north and northeastern states and the birth of the MONAPE – Movimento Nacional de Pescadores (1989).

In spite of these new factors, the development of artisanal fisheries still poses a great challenge, because of the lack of policies, strategies and concrete experiences resulting in a sustained development of the fish production, the betterment of the living conditions of the fish worker communities, better organisation etc. On the contrary, there is a continuous worsening of the problems affecting production by the artisanal fisheries sector, owing as much to objective factors (environmental degradation, the endangering and destruction of natural resources, etc.) as to the ineffectiveness of the government's strategies in overcoming the obstacles that impede the sustained development of the artisanal fish worker communities in the Brazilian coast.

The situation has turned much more serious ever since the shifting, after 1989, of policy making for fisheries from the hands of the SUDEPE – Superintendence for Fisheries Development to the IBAMA – Brazilian Institute for The Environment. As IBAMA solely concentrates on environmental issues, (environmental legislation, and law reinforcement) there is not interest whatsoever in the sustained development of the artisanal fish worker communities. At this juncture, in Brazil, does not exist any specific plan or policy aiming at the sustainable development of artisanal fishing.

In 1998, the government shifted a large part of the responsibilities of the fisheries sector from the IBAMA to the Ministry of Agriculture, constituting the Department of Fisheries and Aquaculture – DPA, leading to duplication of responsibility and thus more confusion in the sector. The new Department of Fisheries and Aquaculture is under the influence of the industrial fisheries sector, and is mainly concerned with the leasing of foreign boats for tuna fishing, ignoring important aspects like the establishment of a new fishing policy.

This work intends, besides making an analysis of the situation of artisanal fisheries, to put forth some alternative strategies for the development of the sector, to non-governmental organisations and to the regional and national organisations of artisanal fish workers.

1. Natural ecosystems and the cultural diversity of the artisanal fish workers

Artisanal fishing is practiced in a variety of ecosystems that greatly influence the way fishing activities are organised. Sea currents, winds, tides, waves, coastal vegetation, fauna and flora and particularly ecological cycles are important elements that are taken into consideration by artisanal fishermen in order to organise their fishing activities.

The Brazilian coast is located between latitude 4°52'45"N and 33 °, 45'10s"S and is approximately 7,408 km long, presenting a variety of coastal and marine ecosystems such as dunes, reefs, bays, estuaries, lagoons, mangroves and cliffs.

There are coastal plains formed by sand deposition of the Quaternary Period and mangrove areas in the north and Northeast regions, where the Tertiary formation reaches the sea. In the southeast, the Pre-Cambrian structure of the "Serra do Mar" almost reaches the coastline, creating cliffs and small bays.

Figure 1

Brazil's continental platform is the continuation of the continental mass directed towards the ocean. The width varies, being wider in the north of the country, becoming narrower in the northeast and wider again in the southeast and southern region.

There are three oceanic systems affecting the Brazilian coast; the Southern Equatorial Current reaches the coast at 5°S going northward. The states of Maranhão, Pará and Amazonas on the northern coast are affected by the Northern Equatorial Current and are also areas with a high tidal range. The Brazilian Current affects most of the Brazilian coastline between 25°S and 5°S. The southern of Brazil's coast is affected by the Malvinas Current which travels from the southern part of the continent up to 30°S (Figure 1).

Tidal ranges become smaller from north to south, with values up to 7 meters in the north (São Luís, Maranhão) or less than 1 meter in the south (Imbituba, Santa Catarina).

The region includes a diverse range of coastal formations ranging from the intertropical realm in the Amazonian region, to the tropical realms in the north and northeast of Brazil, to the temperate marine areas of the south.

The great size of Brazil allows for considerable diversity of coastal exposure and geomorphologic development. There are three principal portions of the shore. The first is the area in the north that is influenced by the Amazon River and its sediments; the second is the narrow coastal margin fringing the huge Brazilian Shield, creating an escarpment nearly adjacent to the ocean; the third is the southern area where considerable quantities of sediments have accumulated to provide a barrier island formation.

The mouth of the Amazon River is a great estuary stretching for hundreds of kilometers inland. Large quantities of sand and especially silt and clay are discharged by the river and accumulate along the shore margins. From the border with Surinam eastward to the Baía de São Marcos, the fine-grained sediments blanket the shoreline and are cloaked with mangrove. East of the Baía de São Marcos the shoreline begins to be characterised by sandy beaches lying before low hills. The sand beaches are interspersed with mangrove stands.

Beginning in Rio Grande do Norte and continuing southward to the coastal margin of Alagoas state, the beach zone is severely attenuated. The dry climate and the short drainage systems limit the transport of sediment to the ocean margin. This portion of Brazil is bordered by fairly extensive coral reef formations.

South of Recife the coast is cliffed. The combination of cliffed coast and the presence of coral reef extend for about 500 kilometers. Sandy beach backed by an escarpment begins near the

Alagoas-Sergipe border and continues south to the state of Rio Grande do Sul. The beach often broadens in large curvilinear embayments, and there may be local mangrove stands, beach ridges, and deltaic build out. In the state of Paraná there is an extensive area of beach ridge development. The beach ridges attain elevations of 10 meters in their interior location and gradually decrease to elevations of 2-3 meters near the shore.

The coastal margin of the state of Rio Grande do Sul is distinct from the rest of Brazil, consisting of a classic barrier island-lagoon sequence. Broad sandy beaches extend along the coast for 640 kilometers and incorporate wide beach ridge systems and large coastal dunes reaching 25 meters in elevation. The northern margin of this coastal plain comes against a terrace surface with elevations of 15 meters.

1.1. LIFE SUPPORT SYSTEMS ALONG THE COAST

There are a large variety of inshore and coastal ecosystems, in which diverse communities of artisanal fish workers live and work. Thus, in the southern end of the country, there are artisanal fishermen, who are descendants of the Azorean migrants who developed techniques and systems suited to a jagged coastline, with many islands, bays and lagoons. In the southeastern region are the "caiçaras", descendants of the Portuguese colonisers, natives and blacks who combine small-scale fishing with agriculture. In the northeast the raft fishermen (jangadeiros) who use a specialised raft adapted to beaches without piers, known as the "jangada". In the northern end are the "praieros" fishers who developed a large variety of boats suited especially to a coast with fluctuating tide conditions.

The Brazilian coast presents a variety of ecosystems and habitats. The most relevant are:

Coral Reefs

The distribution of coral reefs in the South Atlantic is limited to tropical areas along the coastline and offshore islands of Brazil. The coral fauna has long been considered of interest on account of its high proportion of endemic species. Some 3,000 kilometers of coast has reefs, although not all of these are true coral reefs. Ten of the 18 hermatypic coral species known from Brazil are endemic.

Two main coral reef formations may be identified on the Brazilian coast. The first is Grupo Recife do Cabo São Roque that unfolds from Cabo de São Roque until Natal in Rio Grande do Norte State, along which are the Fernando de Noronha archipelago and the Rocas atoll; the second is the assemblage of coral reefs situated in the Bahia State's south coast (the Abrolhos archipelago), which is the richest and most developed coral reef formation in the region. In addition to these main formations, coral reefs also occur between Natal and the São Francisco river mouth and on the latitude of Salvador Bahia (both usually associated with calcareous reefs).

The northeast coast formations are rocky calcareous outcroppings forming reefs and hence differ from the coral reef formations such as those of the Abrolhos archipelago. Coral reefs are important habitats where artisanal fishermen work.

Figure 2. Mangroves along the Brazilian Coast

Mangroves / Estuaries

These ecosystems extend almost along the entire coast of Brazil, from Oiapoque (Amapá) to Laguna (Santa Catarina), occupying an area of about

25,000 km^2. The northern limit of mangroves on the American continent is found in Florida (U.S.), at extending to Santa Catarina state in southern Brazil. The most extensive areas of mangrove are associated with the mouth of the Amazon River in the north of Brazil, and well-developed communities extend from the northern boundary of the region to the State of Piauí. Less extensive areas of mangrove are present along the coast until salt marshes become dominant in the States of Santa Catarina and Rio Grande do Sul. Low stands of Avicenna schaueriana and Rhizophora mangle terminate at Florianópolis (27'3O'S), but Laguncularia racemosa extends southward to the pole ward limit of mangrove at the mouth of the Araranguá River (29.S) (Figure 2).

The main areas of higher productivity are the estuarine and coastal habitats, which receive larger amounts of nutrients from continental runoff

These ecosystems and habitats present a large variety of flora and fauna that sustain a variety of economic activities. Birds, fish, crustacea, mollusks, mammals are abundant in these habitats and some of them are already endangered, including (along Belém coast) Eudocimus ruber (guará), Phoenicopterus ruber (flamingo), Trichechus inungis (Amazonian manatee), Procyon cancrivorous (crab-eating racoon) Dermochelys coriacea (trunk turtle): Along the Amapá coast: Dendrocygna autnmnalis (marreca), Chelonia mydas (green turtle). On Maranhão coast: Harpia harpya (harpy eagle), Aratinga garoupa (golden paroquet), Porphyrula martinica (rail), Alouatta fusca (howling monkey), Tricherus Manatus (manatee); on Mucuri estuary: Falco peregrinus (Peregrine falcon), Ara ararauna (Canindé macaw); on Linhares grassy marshers: Crypturellus noctivagus (zaeble red-footed tinamou), Myrmecophagus tridactyla (great anteater), Lutra enudris (otter), Dermocheluys coriacea (trunk turtle); on Iguape-Paranaguá estuary; Bubo virginianus (jacurutu), Cebus apella (macaco-prego), Tapirus terrestris (anta)

Some fish species are being severely over fished, in particular, shrimps Penaeus schmitti, brasiliensis, paulensis, Panulirus argus and P. laevicauda (lobsters), Bachyplatytoma vaillati (piramutaba), Sardinella brasiliensis (sardines) and several species of mangrove crabs.

Although these ecosystems are protected by law they are threatened by urbanisation projects and more recently by the construction of ponds for shrimp cultivation, particularly in the Northeast.

Coastal lagoons

Coastal lagoons are bodies of water separated from the ocean by sandbars Tropical lagoons can have varying degrees of salinity due to rainfall. They have an elongated shape, generally narrow along their principal axis which is parallel to the coast. Sandbars (restingas), reefs, raised terraces formed by fluvial and marine sediment accumulation as well as beaches, contribute to the formation of lagoons. Exemples are: Feia, Araruama, Saquarema, Maricá, Sepetiba (in the State of Rio de Janeiro), Roteiro, Jequiá, (in Alagoas) Mirim and Tramandaí (in Rio Grande do Sul). Dos Patos lagoon in southern Brazil is one of the most important centre for artisanal fisheries in Brazil.

Barrier Islands

Barrier Islands are stretches of sand deposited in parallel to the coast and created by the dynamic of ocean waters. These deposits occur when the coast forms a headland or cape, which often borders a series of small lakes. They are common in the southern coastline of the State of Bahia and Rio Grande do Sul. The main Brazilian “restingas” are: Ilha Comprida (São Paulo) and Marambaia. (Rio de Janeiro)

Other Coastal Wetlands and Saltmarsh

In Brazil tidal marshes occur as a pioneer community and as a secondary formation in disturbed areas within mangrove wood along the coast. Tidal marshes become prevalent on the southern coast of Santa Catarina and Rio Grande do Sul where extensive saltmarsh formations are found, the most important being associated with the Patos, Mirim and Mangueira lagoons in Rio Grande do Sul. Saltmarshes are found in the following locations in Brazil: the bays of Paranaguá and Guaratuba (Paraná, the Lagoa de Conceição (Santa Catarina) and principally, the coastal lakes in the southern region such as the Patos, Peixes, Mirim and Mangueira lakes.

Tidal flats

Tidal flats are low littoral coastal areas which are covered by the tides and are of great ecological importance. Examples: Marituba (Alagoas) and Marajó (Pará).

Beaches, Dunes, Cliffs

The best-developed beaches and dunes are found on the coast of Brazil. In the north much of the shoreline is formed by sandy beaches interspersed with mangroves lying before low hills. Sandy beaches continue from Alagoas State to the south where large dunes and barrier island formations occur.

Islands and Submerged Banks

The Brazilian coast has a variety of large islands such as Marajó, at the mouth of the Amazon, São Luís, in Maranhão, Ilha Bela and Ilha do Cardoso, in São Paulo, Ilha Grande, in Rio de Janeiro, Santa Catarina, in the State of Santa Catarina. There are also some oceanic islands and archipelagos.

Atol das Rocas lies about 200 kilometers northeast of the coast of Rio Grande do Norte State. The atoll is an almost circular reef possibly lying on the same submarine shelf (the platform of the Rio Grande do Norte) as Fernando de Noronha. This one is a volcanic archipelago consisting of a principal island of 17 square kilometers and eighteen islets of varying sizes. The archipelago lies 350 kilometers northeast of Cabo de São Roque and has a similar flora and fauna to the Atol das Rocas. The islands of São Pedro and São Paulo (St. Paul's Rocks) are situated in the Atlantic about 500 kilometers northeast of Fernando de Noronha.

Restingas (sand barrier)

"Restingas" are found along the Brazilian coast in Marambaia (Rio de Janeiro), Ilha do Cardoso and Ilha Comprida (São Paulo), Guarapari (Espírito Santo) and São José do Norte (Rio Grande do Sul).

Coastal ecosystems are utilised by artisanal fishers. Jangadas, a type of raft, are used in the Northeast and the fishermen in the south-southeast use small boats of about 8 meter length, with an in board motor, many times used in the trawling of the sete-barbas shrimp (xiphopenaeus kroyeri) a variety of shrimp.

Open Ocean, Deep Sea, Upwelling

On the Brazilian coast, areas of upwelling are rare due to stratification of the water masses that prevents the surface layers from receiving nutrients from bottom layers. The main exception is areas of upwelling in the Cabo Frio region (near Rio de Janeiro).

These ecosystems are used particularly by the industrial fleet in tuna and related species fishing.

1.2. DEGRADATION OF THE COASTAL ECOSYSTEMS AND ITS IMPACT ON ARTISANAL FISHING

While the traditional use of the coastal ecosystems, as in artisanal fishing, has little effect on the natural resources, the more recent utilisation of these ecosystems has intensified the degradation of these environments considerably, generally in places where there is urban-industrial activity. The artisanal fishers use almost all these ecosystems and their contamination, has been of grave consequence to the productivity of the sector and the quality of life of the coastal communities.

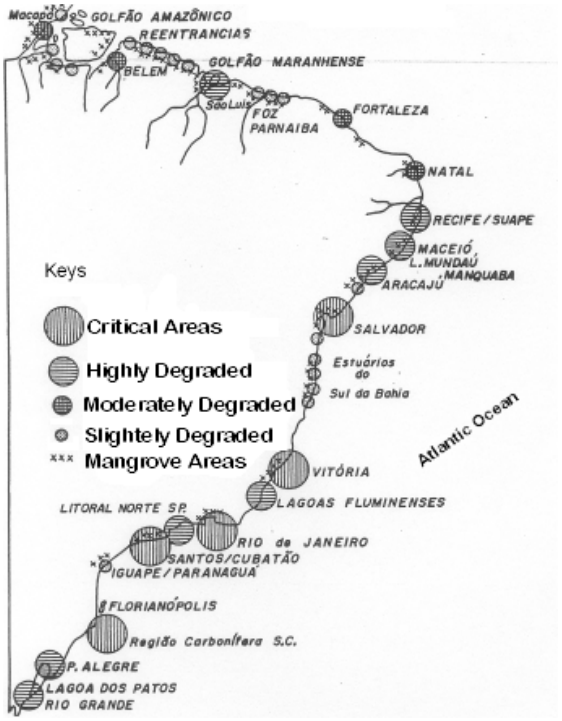
Along the coast, the most important ecosystem is the Atlantic Forest that at the beginning of the Portuguese settlement covered around 1,000.000 sq. km. In many parts of the country, this forest reaches the coastline, and in this sense, mangroves can be considered part of this large forest. The Mata Atlântica (Atlantic Forest) has a biological diversity as high as that of the Amazon Forest with a large number of endemic species. From the 60's onwards when the urban-industrial development was accelerated, this forest was even more intensively destroyed and today only

around 5 to 10 percent of this large forested biome still exists, mainly along coast of Southern Rio de Janeiro, São Paulo and Paraná States. The Mata Atlântica is also home of different human cultures, such as Indians and their descendants, the "caiçaras", and the "jangadeiros" (raft fishermen) that have developed a deep knowledge and traditional management systems of the forest and their adjacent coastal ecosystems.

During the colonial period the coastal zones where used as trade centers and as the gateway to conquest of the hinterland where the mineral and agricultural resources were abundant. Major cities were usually located on the coastline, thus ensuring communication with the colonial power overseas as well as the hinterland. Marine resources, with the exception of whale hunting, were also exploited at subsistence level. During that period boat construction was one of the few important industries on shore and was responsible for intensive woodcutting in some northeastern provinces.

After Independence, and particularly during the second half of the 19th century, most of the important economic activities, such as coffee, rubber and sugar-cane plantations, shifted from the coastal zone to the hinterland. At the beginning of the 20th century, industrialisation led to the production of goods for the internal market to replace imported products. Small industrial plants to process cotton and food products were concentrated both in the hinterland and on the coast.

Figure3: Levels of Degradation of Estuarine Ecosystems in Brazil



After the 1950s, Brazil pursued an industrial economic model oriented towards export. Most of the heavy industries (chemical, petrochemical, and fertiliser) were and are still located in estuaries and bays and next to other fragile coastal ecosystems. Such large industrial centers were located in areas as in São Luís Island (for alumna processing) in the Northern State of Maranhão, in the coastal lagoons of Maceió, (Alagoas), in Salvador Bay, in the Vitória Island (for iron export), Rio de Janeiro bay, Santos-Cubatão, in São Paulo, and in the southern lagoon Dos Patos. Huge harbors for export of mining production were established in São Luís (Vale do Rio Doce Cia. in São Luís (Maranhão and Vitória, Espírito Santo). Examples of these large industries settled on the coast are: Chemical industries in Arraial do Cabo (Rio de Janeiro)-, in Aratu and Camaçari in Salvador, (Bahia), oil and chemical industries in Cubatão (São Paulo), Dow Chemical, Petrobrás and Petroflex in Rio de Janeiro; Salgema in Maceió (Alagoas); fertilisers in many cities around the coast; coal mining near the coast of Santa Catarina and Rio Grande do Sul; iron production - Cosipa in Cubatão, CST and Cia. de Ferro e Aço in Vitória. Paper pulp production, involving large areas of eucalyptus plantations is important along the coast of Espírito Santo and southern Bahia. (Aracruz Papel e Celulose). Many alcohol distilleries have been established along the coast, particularly in the Northeast.

Picture 1: Fishing canoe in the mangrove

As a result, pollution has been heavily concentrated in this zone and coastal degradation has been extensive (Figure 3).

Increasing urbanisation is a crucial process that affects the coastal area, as five of the nine metropolitan areas in Brazil are located on the coast: In 1990 Rio de Janeiro had 9.6 million inhabitants; Recife had 2.5 million inhabitants; Salvador had 2.4 million inhabitants; Fortaleza had

2.2 million inhabitants and 1.3 million inhabitants. In addition to that, many capitals of States are also on the coast: São Luís (655.000 inh.), Natal (606.000 inh); Maceió (626.000 inh.); Vitória (523.000 inh); João Pessoa (695.000 inh); Florianópolis (254.000 inh).[1] Many of these coastal cities have a high demographic growth, attracting migrants from the hinterland and a high percentage of these migrants live in "favelas" (slum areas, in Salvador, Fortaleza, Rio de Janeiro)

At the same time, coastal cities are expanding as poor people migrate from the countryside, where the modernisation of Brazilian agriculture has led to an increasing concentration of productive land in the hands of few land owners and groups, both national and multinational. With the expulsion of small landowners and peasants from the countryside, slum areas have been established in large coastal cities. Most sewage systems are inadequate, resulting in increasing pollution of coastal rivers, estuaries, lagoons and bays.

As road transportation has the highest priority in Brazil, many highways have been building along the coast. One clear example is the BR-101 built in the 1970's that link many coastal capitals. During the construction process, many beaches and mangrove areas have been damaged, as has occurred between Santos and Rio de Janeiro. These coastal roads have also encouraged the construction of villas by tourists, and causing also the displacement of many small-scale fishing villages inland and to the mangrove areas, resulting in the destruction of the Atlantic Forest.

Oil drilling is an important economic activity along the Brazilian coast, and oil production started in 1973. The main drilling along the coast are Campos (Rio de Janeiro), Sergipe, Piauí, Rio Grande do Norte, Amazon basin and Recôncavo Baiano. Over 56% of the oil produced in Brazil comes from marine basins. There are important harbors where oil is brought ashore, the most important of which is situated in São Sebastião, where regularly there are many accidents. Tourism, fisheries as well as mangroves and other coastal habitats suffer from frequent oil in the area. Coal is also produced in coastal area of Santa Catarina and Rio Grande do Sul. Reefs are also exploited mainly in the Northeastern coast for construction.

Tourism and recreation became one of the most important factors influencing the use of coastal areas and resources. Around 1.6 million foreign tourists visit the country, in particular the coastal tourist resorts, generating an income of 1.55 billion dollars and around 1.4 million jobs.

In 1992, EMBRATUR (Brazilian Agency for Tourism) has established the Plantur-National Plan for Tourism that has created several touristic development poles in the coastal areas. In 1991, SUDENE (Agency for the Development of the Northeast) and EMBRATUR have created PRODETUR (Programme for the Development of Tourism) and have requested a US 1.6 billion loan to the Interamerican Development Bank. This large programme is directed to the Northeastern coast, involving the construction of large hotels, roads, improvement airports and urban infrastructure, such as water and sewage. This programme follows the intensive use of the coastline which exists today in Cancun, Mexico. The ecological and social impacts of this programme have not yet been properly assessed, by social and ecologist groups of the area are reacting against it, since local communities and the environment will suffer the most.

Fisheries are also an important economic activity along the coastal and marine environments. In addition to the increasing degradation of inshore and coastal environments, over-fishing undertaken usually by industrial boats is also occurring affecting particularly fish species such as shrimps, lobsters, cat fish (piramutaba), and sardines, among others

Aquiculture is a fast growing activity along the North and Northeastern coast affecting several inshore ecosystems such as mangrove, sand barriers and lagoons. The highest impact comes from shrimp cultivation which recently started to be implemented in the states of Ceará, Rio Grande do Norte, Paraíba, Maranhão and Pernambuco, resulting in massive destruction of mangroves and associated ecosystems. Large-scale shrimp cultivation is also affecting the livelihood of artisanal fishermen as they are loosing their traditional fishing areas.

2. Fisheries in Brazil

2.1. A BRIEF HISTORY

Fishing and mollusk harvesting were important activities for indigenous people before the arrival of the Portuguese colonisers in the XVI century. In several areas of the coast there are mounds of oyster shells (sambaquis) showing that for several centuries' indigenous people feed on mollusks and fish. Jean de Léry, a French Calvinist who visited Brazil in early 1500 has described fishing techniques used by coastal Indians such as bone hooks, and small nets made of fibers found in the forests as well as canoes and "jangadas", rafts made of floating logs. Fishing was also important along the Amazonian rivers and Indians used fish as the basic source of protein.

Whaling was the main commercial fishing activity undertaken by the Portuguese since the beginning of the colonisation as for several decades was a monopoly of the State. Until the end of the slavery, in 1888 fishing activities in the Northeast was undertaken mainly by African slaves and fish production was used to feed laborers in the large farms and in the towns. Along the coast independent producers also used part of their time for fishing and fish like mullet was a basis for protein consumption in coastal towns and villages. The social upper classes however used to import salted cod from Portugal. (Silva, J.G. 1997).

Two types of relations with the sea were developed. In the provinces of São Paulo and Rio de Janeiro, small farmer-fishermen combine fishing with agricultural activities. In the Northeast, coastal communities have developed a long tradition of coastal fishing, separated from agriculture. One explanation for this difference, in addition to cultural factors, relies on the fact that the continental shelf is narrower in the Northeast than in the South and that most of the fish species live in rocky habitats further from the coast, requiring a better navigational and fishing knowledge from the fishermen. The sandy coast of that area also inhibited intensive agricultural activities. In this connection one could conclude that artisanal fishermen in the Northeast have a strong tradition in dealing with the open sea. Recent studies have analysed the question of tradition within the framework of the field of maritime anthropology. Most of the fishing was done within the system of the petty mode of production, where part of the fish caught was used for subsistence and part as commodity.

Legislation regarding coastal land has contributed to (but also interfered negatively with) the development of traditional sea tenure. Since the middle of last century a stretch of 33 meters of land measured from the 1833 highest tide belongs to the state (called Terras de Marinha). This area cannot be privately owned and no permanent construction can be made in that area without State permission. Small-scale fishermen, although having no legal title, occupy these areas. In this sense, they have customary rights of occupancy (posse) to live in those areas, where they build their thatched roof houses. The same right (posse) is transferred to the nearby coastal waters when they occupy a place in the estuaries and lagoons to build their fixed traps (cercos).

The State, through the Navy, also tried to control the artisanal fishermen through forced service. As a result, some fishermen's rebellions occurred in 1903 in Rio de Janeiro and Ceará. To control these rebellions the Brazilian Navy created in 1921 the first fishermen guilds. According to the guild regulations all fishermen should be registered in order to get permission to fish. In practice, each coastal municipality has its own guild that regulates the lives of fishermen. According to the new 1988 Constitution, however, fishermen can organise their own free associations.

Commercial fishing was developed more intensively since the beginning of the XX century, particularly in the southern states, the Portuguese and Spanish migrants started to use larger boats for sardine fishing, used also for canning. Industrial fishing was developed more intensively after the Sixties with the support of a large fisheries development programme undertaken by SUDEPE – Superintendence for the Development of Fisheries. By that time, however, most of the fishing was done by artisanal fishermen along the coast and rivers.

2.2. FISHERIES PRODUCTION

The FAO calculated the sustainable potential for capture as between 1.4 and 1.8 million tones. The national yield has stabilised at 600-700 tones in the decade of the 90's (after a rapid growth between 1960 and 1975).

Table 1.Total yield of fish/year: marine fishing and freshwater fishing, 1960-1999

YEAR	Fresh water fishing (t)	%	Marine Fishing (t)	%	Aquaculture				TOTAL
					Brackish		Fresh water		
1960						%		%	281.512
1970									526.292
1990	219,487	32.0	435,418	68.0					640,295
1999	185,471	18.5	418,470	56.2	26.513	3.5	114.425	15.3	744.597

(Sources: Brazilian Statistical Institute and IBAMA)

The total marine fish catches in 1960 was 281.000 tons and in 1970, during the first years of the Government Fisheries Development plan, there was an increase of 100%, reaching the total catch of 526.292 tons.

In the last decade, total catches had an average of 700.000 tons, from which there is an average of 450.000 for marine catches. There was also an increase aquaculture, in particular fish cultivation in fresh waters, especially in the rural areas in the south and southeast (table 1).

According to Dias Neto (1999) The situation of fishing of the major marine species in the 90's, undertaken particularly by industrial fishing, according to Dias (1998) is as follows: Sardine: (Sardinella brasiliensis) is, historically the main fish resource as far as total yield is concerned and is harvested along the southeastern coast. The production system is based on family business and large companies, and fishing is undertaken with the use of encircling net .The fish stock has decreased dramatically in the 90´s, due probably to over fishing and climatic change. Several canning industries closed down as result of this situation. Sardine fishing has shown some recovery by the end of the 90´s, but the resource situation is still considered to be critical. Most of the production is targeted at the internal market and was consumed by low income people. There are several regulatory measures such as: minimum size of capture, suspension of fishing during the procreation period and prohibition of the entry of new sardine fishing boats.

Lobster (Panulirus argus and P. laevicauda) is an important export oriented species harvested in the Northeast by artisanal fishermen and fishing firms using traps and nets. The yield is decreasing in the last years, and minimum size is used as regulatory measure. Regulatory measures: minimum size of capture

Cat fish (piramutaba) (Brachyplatistoma vaillalnti) is a valuable species harvest in the Amazon by artisanal and industrial fishermen, using trawling and long lines. The main problem is over fishing and trawling is prohibited in certain areas. Today the harvest is directed to the internal market.

Pink-shrimp (camarão rosa) of the South-Southeast (Penaeus brasiliensis and P. paulensis). This species is harvested in the Southeastern region, from Rio de Janeiro to Rio Grande do Sul and target to external as well as internal market. The fishing is done mainly by industrial boats, although this shrimp species is also caught by artisanal fishermen. The situation of the stock is considered to be critical due to over fishing. The main regulatory measures are: minimum size and Closed seasons

Sete-barbas shrimp (Xiphopenaeus kroyeri) is also harvested in the Southeastern region. Artisanal fishermen harvest this species using small trawlers. Production targeted at the internal market and the resource is highly exploited. Regulatory measures are: control of the size of the net and number of boats

Demersal fishes in the Southeast-South (Micropogonia furnieri, Macrodom ancylodon and Cynoscion estriatus) (corbine, weak fish): The area of harvesting is the Southeastern region and production is entirely directed to the internal market. These species are caught by artisanal

fishermen as well as by industrial fishermen. There has been a certain decrease of the stock due mainly to over fishing by the industrial fleet.

Tuna fish (Katuwonus pelamis, Thunus obesus, T. alalunga, T albacares, Xiphias gladius, Coryphaeuna hippurus, Scomberomus cavalla and S. brasiliensis)

The area of harvesting is the open sea and in the Exclusive Economic Zone. The tuna fishing is done exclusively by the industrial fleet and directed to export. There is still some potential for catch increased.

It is important to observe that the IBAMA exercises a certain control on the species harvested by the industrial fishing firms, but there is little information on the situation of the resources captured exclusively by artisanal fishermen, mainly in estuaries, lagoons, beaches and rivers.

The overexploitation is a result of the growing demand for species such as shrimp and lobsters, acquired by the intermediaries above the quantities permitted by the law. To our understanding it seems that over fishing, encouraged by the opportunistic middlemen is not solely responsible for the lowering of the productivity; there are also other factors such as urban-industrial pollution and environmental degradation that are equally important causes.

On principle the possibility of the expansion of the fishing of certain demersal and pelagic species exists: weak fish, corbines, tuna, lane Snapper, but there are signs of over fishing, mainly in the most important fish resources such as sardines, shrimp, lobsters and the piramutaba catfish.

Besides the capturing of fish, there is also great potential, not yet exploited, in mariculture, above all of mussels, oysters and prawn. The molluscs (crabs, large oysters and mussels) are extracted artisanaly in all the regions in the country, when fish capturing is small, the collection of mussels and shellfish done by women and children supply the poorest with their daily nutrition.

Picture 2 – Small scale oyster culture in Cananéia-SP

There is also a tradition of extensive cultivation of fishes and crustaceans in the brush parks, ponds and tanks constructed by small fishers. The extensive cultivation in ponds in the Northeast represents an important part of the diet of the rural population.

Intensive aquaculture nevertheless is carried out by companies and is in state of heavy expansion in Brazil, especially in the Northeast where there is a great threat to the mangroves, a legally protected ecosystem, and to the way of life of the artisanal fishers.

The fresh water prawn (M Rosenbergii) was introduced in the 70's and is the most important species in commercial cultivation in the Brazilian coast. This activity is in its infancy but it is growing rapidly. There are also plans to expand sea prawn culturing (Penaeus schmitii, Penaeus paulensis and P Japonicus). This could pose a grave threat to the mangroves, which are ecosystems totally protected by the law and to the artisanal fishers who work in these ecosystems. The production of shrimps in ponds grew from 2,385 in 1994, to 15,000 tones in 1999, utilising an area of 5,000 hectares. In 2000 the total shrimp culture reached 25.000 tons, mainly for export, occupying around 7.000 ha. Aquiculture has increased its proportion of funding, from 120.000 US dollars in 1990 to 13.028.000 dollars in 1996, as loans taken from the National Bank for Social and Economic Development-BNDES. (Martins, 2002)

3. Fish marketing and processing

Most of the frozen fish traded in large cities, in super-markets are supplied by industrial fishing industries and imported fish. Artisanal production is generally traded in coastal towns and regional centers. Most of the, crabs, mussels, oysters and other shells are produced by artisanal fishermen, and the commercialisation is done, sometimes, through cooperatives. In Santa Catarina, many small-scale fishermen are becoming oyster cultivators, partly due to the decrease in fish stocks. Mussels are also being cultivated by small-scale fishermen in the northern coast of São

Paulo. Fish from rivers, lakes as well as from sport fishing is increasingly important as source of protein in urban centers.

3.1 THE MARKET

Brazil has a population of around 170,000,000 people who consume around 6.4 kg/person/year; lower than the international average, which in 1990 were around 13.5 kg/person/year. A large part of the catches (70%) is for consumption and 30% for the production of fish oils and fishmeal.

Till 1998 the country used to export more fish than it imported, but this trend was reversed and today imports are rising considerably. The main products exported are shrimp, lobster, lane snapper and catfish (piramutaba) to USA, the European Union and the countries in Mercosul. Paraíba State is becoming an important harbor for tuna export, having exported 10.000 tons to US and Europe in 2.000.

The imports come mainly from Argentina (hake) and Chile (salmon) and Norway, Portugal and Canada (cod). In 1995 Brazil imported 206,362 tones of fish and in 1997, 190,105 tones, the equivalent of 1/3 of the total national capture. (BNDES, 1996)

Most of the fish export is done by fishing industries located in the Santa Catarina, Rio de Janeiro, São Paulo, Ceará and Pará states. However, part of the lobster and shrimp exported is catched by artisanal fishermen and sold to local industries for export.

The network of fish trade in artisanal fishing villages is complex, involving often middlemen in several levels, from the beach to the neighbor cities and central markets in State capitals. In the Amazonian region, for instance artisanal fish workers, especially those who live far from the cities are totally dependent on the middlemen or monopolizers. In Pará the fish bought by the "geleiro" is resold to the "weigher" who in turn sells it to the "retailer" and from there it is sold in the "retail market". In the 70's, due to the widening of the roadways network, the traders in the cities as well as the fishing companies used to send their trucks to the beaches to purchase fish from artisanal fishermen. The fishing companies pay for the fuel of the motorised artisanal boats in exchange for monopoly given to them in the purchase of the catch.

3.2 THE PROCESSING INDUSTRY

According to the Ministry of Agriculture, in 1995 there were around 277 fish storage and processing units in the country, as compared to the 338 that existed ten years ago. This meant a decrease by 18% of industrial units, between 1985 and 1986. The sardine sector suffered a significant loss in that decade, caused by the drastic reduction in the catches of sardine (Table2).

Presently (1995) these units are distributed state wise as follows:

Table 2 Industrial Units in the major states

State	Number	%
Santa Catarina	55	19.9
São Paulo	49	17.7
Rio Grande do Sul	27	9.7
Rio de Janeiro	26	9.4
Pará	24	8.7
Ceará	19	6.9
Others	77	27.7

BNDES, 1996

The centers which are historically important for the fish processing industry are Rio de Janeiro and the southern region of the country, mainly Santa Catarina and Rio Grande do Sul. The industry in Rio Grande is mainly constituted by plants established since the beginning of the XX century, when industrial fish harvesting was introduced by Portuguese fishermen. When many of

the subsidised firm went bankrupt in the 80's and 90's, due to over fishing and poor administration, and when these subsidies were cut subsequently , multinational firms such as Quaker and Unilever bought Brazilian firms.

Funds for industrial fisheries development ceased when SUDEPE was extinguished in 1988 and were resumed in a smaller scale by BNDES, The National Bank for Social and Economic Development that, in 1996 released 3.106.000 US dollars for fish processing industries and less than 100.000 dollars for fishing firms.

The plants in the North of the country, particularly in Pará are more recent and have resulted, partly, from the relocation of the plants in the Southern States of the country, whose fishing companies overexploited the main species of fish and shrimps in the southeastern region in the 70's and 80's and subsequently relocated to the Amazonian region where the reserves were relatively unexploited.

The plants in Ceará process lobster for exports and buy an important part of the artisanal production.

In fish processing plants, according to Barbosa, Lima and Anarchy (2000), the division of labor by sex follows a pattern. Men undertake pre-processing tasks — unloading at the port, transporting to the plant unit and weighing. Both men and women contribute to the initial stages of processing: breaking fish stings and placing the fish on conveyor belts. The work that follows takes place in an air-conditioned hall, where sanitation measures are strictly enforced. Most tasks here are performed by women—de-heading the fish, passing them through the rotatory saw (according to the species and market demand, it might be necessary to take off the skin), slicing the fish with a horizontal blade, de-boning, filleting, washing, packing, weighing and arranging the fish in trays. These trays are then transported to the freezer chambers where men take over.

Recently, D. Silva (1999) has compiled data on 26 women workers of Belém. 16 of them happen to be working without registration cards indicating temporary and unstable employment conditions. Sub-contracting by companies was a common feature going by the experience of those interviewed. There is a high turnover of women workers in processing plants – a common feature in this line of work.

Small–scale fish processing is also done at the coastal village level. Traditionally, fish such as mullet and also shrimp is salted, dried or smoked for home consumption or for trade in nearby coastal towns. Women labor is essential in this small scale processing. In some villages, where electricity is installed, some fishermen were able to buy small freezers in which the part of the catch is kept frozen and sold to tourists and restaurants.

4. Fish production systems

There are two systems of fish production in Brazil, which are now interdependent: industrial and artisanal.

Industrial fishing is defined as fish harvesting undertaking by large boats that belong to a fish company. The social and technical division of labor is high and production is sold to processing companies, large markets (exported wholesale centers) industrial fisheries concentrate there harvesting on high market value species such as lobster, shrimp, and tuna.

Industrial fishing experienced fast growth after 1967, with the fiscal incentive policies introduced by the then recently created SUDEPE – Superintendence of Development of Fisheries (1962). After 1967 various fishing companies were set up, with the main objective of exporting the products, mainly shrimps and lobsters. Many of these firms did not have any experience in the sector and basically profited from the fiscal incentives. In this period (1974) 117 industries received fiscal incentives, many of them located in the south-southeastern regions, (77% of the total) and were responsible for the major part of fish production in Brazil. With the stopping of these incentives many of them disappeared. Others after practicing excessive overexploitation in the South-Southeastern regions where they were based, moved on to destroy the fish reserves in the rich Northern Region. Very frequently industrial fishing boats invade areas which are legally reserved for artisanal fishing.

In the 70's there were 204 boats with more than 90 tons of loading capacity, concentrated mainly in Santa Catarina (45), São Paulo (54), Pará (34) and belonging to companies, most of which disappeared with the termination of fiscal incentives towards the end of the 80's. In the beginning of the 70's there were around 7,000 fish workers employed by industrial fisheries and firms, concentrated mainly in the south-southeastern region. As, ever since the disappearance of SUDEPE in 1989, no statistical census has been taken, it is very difficult to know how many fish workers are employed by the fishing industries in Brazil, nevertheless, it is surely a much smaller number than in the 70's.

Today many fish companies in north and northeastern Brazil are located in Belém, Pará, and there are others in Fortaleza (Ceará) and Recife (Pernambuco), and in the state of Amapá. The IBAMA (Brazilian Institute of Environment), a body which controls and regulates fishing activities, has issued fishing licenses for the 250 vessels for prawn and 48 vessels for piramutaba in the northern coast of Brazil. (Maneschy, 2000)

Around 43 fishing companies of the region were associated with SINPESCA) (The Union of Fishing Industries) in 1999, being 40 in Pará and 3 in Amapá. Most of the companies are located in Belém (35), employing an average of 4,000 people but of late this number has reduced considerably. In 1999 hardly 2,800 people were employed in this sector, around 1,500 in fishing and 1,300 in post-harvesting activities, including women who worked in processing.

According to Maneschy (2000). the prawn season in the Northern Region is from February to November. Steel vessels, 22-meters long with 375 hp engines and a gross of 100 tones, are employed. They have a refrigeration system on board. The crew comprises five men and the journey lasts 45 days. Each ship has two trawl nets (double rigs). The prawns re shelled on board washed, brined and stored in the refrigerated chambers. On land they are washed again, classified according to size and packed for refreezing until the time for export. According to the Industrial Fisheries Union of Pará and Amapá (SINPESCA), the catch, which in 1998 was over 2000 tones, is primarily exported to Japan (50 per cent) and USA (30 per cent), while 20 per cent is sold to the domestic market.

The same type of boats is employed for catching fish, though without refrigeration facilities on board. The trips last 15 days. Some 48 boats hold licenses to operate long the northern coasts though SINPESCA admits that some boats operate illegally. At present 60 per cent of the fish production is sold in the internal market and 40 per cent is exported to USA, under the name of catfish (piramutaba and dourada, as local names). According to around 600 tones of fish were exported in 1998 – a drastic fall from 1993 when more than 2000 tones were exported. (Maneschy, 2000)

The artisanal fisheries sector has a long-standing tradition in Brazil and at the time of the establishment of fiscal incentives represented more than 80% of the fish production of the country. Artisanal fishing is practiced in the coastal ecosystems (lagoons, estuaries and the continental platform. It is organised into a number of fish worker communities settled along the coast and in small coastal towns.

Table 3. lists the main species captured by means of artisanal and industrial fishing in the four coastal regions of Brazil.

Region	Artisanal	Coastal Industrial	Oceanic Industrial
NORTH	dourada, corbina, gurijuba, crab, piramutaba catfish	shrimp, piramutaba catfish, Lane Snapper	Lane Snapper
NORTHEAST	mackerel, sierra, Lane snapper, dogfish, lobster shellfish, crab	Lane snapper, lobster	Albacore, bonito
SOUTH/SOUTHEAST	dogfish, corbine, weak fish, plain fish, shrimps and shellfish	sardine, corbine, weak fish, shrimp	Albacore, bonito, dogfish

For the purpose of this article the following classification of regions has been used:

- North: The states of Pará and Amapá

- Northeast: Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia;
- Southeast: Espírito Santo, Rio de Janeiro, São Paulo;
- South: Paraná, Santa Catarina, Rio Grande do Sul;

There is a continuing debate on the definition of the term "artisanal fishing". The criteria adopted by SUDEPE, is of boats with less than 20 tone capacity, which is clearly unsatisfactory, as some industrial fishing boats also fall into this category. As a result statistics on the production are not accurate.

In this study marine artisanal fishermen is defined as an independent fish harvester whose livelihood is based on fishing, on part or full time basis, using family labor on a share basis, using labor and knowledge intensive fishing techniques, employing family community labor on a share basis for harvesting in coastal habitats. The fish catch is usually sold in the market, usually through middle-men, although part of the production is directed for home consumption.

Although the issue of traditional knowledge and management will be handle in chapters 8 and 9, it is important to emphasise that tradition, knowledge and profession are at the core of the definition of artisanal fisherman. A profession is understood as a possession of a set of knowledge, practices and techniques responsible for the perpetuation of fishing as livelihood. In this sense, making a livelihood from the sea, rather from the land, is a basic feature of the communities of maritime artisanal fishermen. The unique character of maritime communities is linked to the physical environment, which suffers marked seasonal changes and is affected by atmospheric conditions leading to rapid transformations in the marine conditions (thunderstorms, hurricanes, seaquakes), which in turn offer constant danger to those working there. Renewable natural resources in the open sea, especially the several species of fish, are mobile and often not visible, migrating from one environment to another and reproducing themselves according to complex patterns.

Artisanal fishermen, in the process of symbolically representing the sea and its living resources, developed different kinds of social, economic and cultural practices for using and coexisting with their maritime environment. These social and cultural practices give a cultural dimension to the maritime environment.

The control over the art of fishing is learned both with the elders and through experience. With the elders one also learns the symbolic representation of the natural world expressed as "the respect" for the laws that govern the sea, its resources and the whole community life. This knowledge is located in the figure of the boat captain who holds the secrets of the sea and the traditional techniques for locating schools of fish.

Traditional artisanal fishermen communities, however, should not be considered as being unchanging or having no history. Several authors in Brazil (Forman, 1970, Mourão, 1971, Diegues, l983, Cordell, 2000) have already shown that various technological changes (adoption of nylon nets, engines, etc) were adopted by artisanal fishermen communities without inducing radical transformation in the relations of productions. In some cases, however, there has been a transformation (partial or complete) of fishermen-peasants into maritime full-time fishermen, who are still integrated into the petty-mode of production.

In the fishing of sardines, for example, where large seine boats and nets belong to the fishing industry, some artisanal fishermen were incorporated into the crews of capitalist fishing boats within a new form of production (Duarte, 1973). The transformation of independent artisanal fishermen in crew members of a large industrial boat, however, is conflictive and in most times, transient, as artisanal fishermen frequently return to his autonomous familiar way of fishing.

Although artisanal fishermen communities share based social characteristics along the Brazilian coast the definition of artisanal fishermen should take into consideration regional specific cultural and ecological features.

The importance of artisanal fishing in Brazil is owing to

a) the volume and value of the catches

b) the number of persons employed in the capturing, processing and marketing of the product.

c) the economic, social and cultural functioning of the fish worker communities spread out in the coastal areas.

Production and value generated by industrial and artisanal fishing

The importance of maritime fish production, between 1960 and 1997 as compared to industrial fishing is shown in table 4.

Table 4. Maritime industrial and artisanal fish production

Year	Total Production tones.	Industrial fishing	%	Artisanal fishing	%
1960	276,000	36,000	16.4	240,000	83.6
1970	478,000	198,000	46.4	280,000	53.4
1980	635,968	392,325	61.6	243,643	38.4
2002	535.403	149.603	47.5	281.329	52.5

(Source: IBGE and IBAMA)

The past statistics show that artisanal fishing was predominant in the 60's, before the introduction of the government's policy of support to industrial fishing. The proportion of artisanal fishing in relation to industrial fishing decreases towards the end of the 70's and the decade of the 80's and in 2002 it once again exceeds industrial fishing. To what do we owe the increase in artisanal fishing in the past years? Without doubt to the fact that the fishing firms, after exploiting areas traditionally used by artisanal fish workers withdraws from them, as they cease to be profitable, thus abandoning them to artisanal fishing. On the other hand artisanal fishing has increased in rivers and dams.

It is necessary to clarify that, in regard to maritime fishing, an important part of the production attributed to industrial fishing companies is in fact artisanal, as the product from artisanal fishing is sold to industries and industrial fleets.

On an average, artisanal fishing is responsible for more than 50% of the total value of the capture, exceeding industrial fish production in some regions (North and Northeast). This indicates that artisanal fishing concentrates mainly on the exploitation of species of higher market value.

Table 5 – Contribution of artisanal and industrial catches region wise (1980-1995).

Regions	Years	Industrial Prod.	%	Artisanal prod.	%	Total
NORTH	1980	4,332	11.5	34,578	88.0	38,910
	2002	27.315	16.7	136,588	83.3.6	163.903
NORTH EAST	1980	21,837	18.0	99,027	82.0	120,864
	2002	13.269	12.0	97,240	88.0	110.509
SOUTHEAST	1980	202,237	79.3	52,707	20.7	254,944
	2000	63.887	65.7	33.401	34.3	97.288
SOUTH	1980	163,929	74.1	57,331	25.9	221,260
	2002	149.603	91.4	14.101	8.6	163.704

Source: IBGE/IBAMA

Firstly, a significant decrease in the total catch is to be noted, in the south and southeastern regions, (around 50%) traditionally the most important regions in the country between 1980 and 2002 traditionally the most important fishing areas. This reduction is explained, to a large extent, by the decrease in sardine fishing. At the same time, there is a minor increase in the total capture in the northern and northeastern regions. In the northern and northeastern regions there is an increase in artisanal fishing in comparison to industrial fishing. In the case of the northern region, it must be emphasised that the data refers to coastal fishing and does not include river and lake fishing, which enjoy great regional importance (Table 5).

In summary, artisanal fisheries is more important than industrial fishing in the North and Northeastern regions and less important than industrial fishing in the South/Southeastern regions.

5. Labor force and technology

It is extremely difficult to calculate of the number of artisanal fish workers, because as we have seen, this depends on the criteria adopted to define the term.

The number of marine artisanal fishermen has increased from 112.318 in 1967 to 248.370 in 2000, due to only to natural population increase but to migration from the countryside.

In 2000 it was estimated that there are about 248.370 fish workers in the Brazilian coast, organised into guilds (Colônias), with the Northeast having more or less 61% of these, followed by the North with 29%. The South has 9.5%, while the Southeast 12%.of the total number of guilds. (Confederação de Pescadores 1986. Table no.6). It is estimated that the number of marine artisanal fishermen is much higher when fishermen not associated with guilds are taken into consideration (Only in the coast, without taking into consideration the inland waters).

Table 6 – Number of fish workers associated and not associated with the Guilds at regional basis-1967-2000

Years	1967	%	1986	%	2000	%
North	8.362	7.4	49.393	19.0	72.164	29.0
Northeast	39.732	35.3	104.759	40.4	152.548	61.4
Southeast	9.703	8.6	47.522	18.3	29.931	12.0
South	19.723	17.5	57.506	22.2	23.658	9.5
Total	112.318	100.0	259.212	100.0	248.370	100.0

Source: Sudepe: 1967; Confederação Nacional dos Pescadores – 1986 (National Confederation of Fish workers) and IBGE 2000

Another important factor is the place of residence; around 51% of them live in rural areas against 49% of residents in urban areas. In the North and in the Northeast, artisanal fish workers live mainly in rural communities, while in the Southeastern region they are mainly urban dwellers. Given that these data of the IBGE refer to the 70's and keeping in mind that rural-urban emigration was high in that period, it can be presumed that the degree of urbanisation of the artisanal fish workers is much higher now (Table 6).The artisanal fleet comprises 49,105 boats, of which 42,850 are non-motorised and 6,335 are motor boats. The Northeast has the largest number of motor boats (around 35%) followed by the South (Rio Grande do Sul and Santa Catarina) with around 30% (SUDEPE).

6. Organisation of artisanal fishing at regional basis

The vast expanse of the national territory, the diversity of the aquatic ecosystems and of the fishing methods, call for a region wise analysis. The Brazilian coast is divided into four major coastal regions: The Northern Region, the Northeast, the Southeast and the South (see figure 4).

6.1 NORTHERN REGION (FROM AMAPÁ TO PIAUÍ STATE BORDERS) GEOGRAPHICAL CHARACTERISTICS

A vast continental platform, formed by sedimentary deposits brought by the River Amazonas. These waters are highly productive and this is one of the areas with maximum fishing potential in Brazil. It is an area with extended mangroves and very productive inlets, where an important number of artisanal fishermen live.

Picture 3 – House of fishermen in the Amazon

Production and Technology

A large proportion of boats are non-motorised, in particular in the communities of artisanal fish workers and

motorboats are used in urban centers and ports, such as Manaus and Belém.

According to Maneschy, (2000) the state of Pará has both industrial as well as artisanal fishing. For the first, the main focus is the external market (domestic and international). Artisanal fisheries supply the local, regional and national markets. The traditional sector comprises a heterogeneous mix of people and social conditions. The industrial fleet comprises a little over five per cent of the total fleet, and is greatly outnumbered by the artisanal fleet. CEPNOR-IBAMA (The Brazilian Institute for Environment) figures mention that in 1998 there were 3.966 boats in the 15 coastal municipalities of Pará. Of these, only 204 belonged to the industrial sector. A large number of small boats are non-motorized. Wooden boats, up to 12-meters long, predominate. While the industrial fleet operates motorized trawling, both for fish (the Ariidae, catfish being the main catch) and for the prawns, the traditional fleet employs mobile gears, using netsand espinhéis, which are long lines with hundreds of hooks.

The types of boats used for small-scale fishing are of indigenous and Portuguese origin. While these are fishing boats, the "geleiras" are boats used for the transportation of foodstuffs and ice, and in general belong to traders who buy fish from the small fishers. The most important species captured by the artisanal method are shrimp, gurijuba, piramutaba catfish, corvine, dourado and crab.

Till 1970, almost all the fishing in the region was artisanal, the period in which pioneer fishing firms began to be established, dealing in the capture of piramutaba catfish and shrimp for exports.

The total potential for sustained capture is between 390 and 480 thousand tones. In 1997, the total production was 139,645 tones or almost 20% of the total national catches. Out of this, around 70% is a product of fresh water fishing, as the northern region is the only one in which the yield from rivers and lakes is higher than maritime yield. Artisanal fishing is important in this region, producing 83% of maritime production and this percentage is still higher in river and dam fishing.

According to Barbosa, Lima and Maneschy, (2000), aquaculture is relatively new in this region. The government is making efforts (through the State Agriculture Ministry, for example) to develop the potential in the region which, according to experts is high, given the hydrological conditions (Moraes-Riodades, personal communication). According to Val et al, (Moraes-Riodades, unpublished) there are around 450 aquaculture farms in the Pará, in which. 16 municipalities cultivate fish and shrimp species. The main native species are being cultivated mainly by medium and small producers. Some fish worker colônias (recognised organisations which represents fishermen at the municipal level) in the state, like that of Araní (Z-40), Cametá (Z-16) and Abaetuba (Z-14) support the practice of aquaculture by fish worker families, as it provides additional income for poor people.

Organisation of fish workers:

As it was mentioned before, the Northern region houses nearly 20% of the total fish workers in Brazil, a majority of them being artisanal fish workers.

The fish workers are organised into Fish worker Colonias, whose membership is obligatory. There are four colonies in Amapá and 44 in Pará. A considerable number of the presidents of these colonies are not members of this profession, the same being the case with town councilors and the fish traders etc. They exercise great influence on the fish workers, which is a restraining factor in the finding of a solution to the problems which besiege this sector in the region. Of late, as a result of the activities of non-governmental groups (The Church, MONAPE) there has been a move to change the orientation of some colonies in the area (Santarém, in Pará) with the introduction of elections for the post of president.

The social relations among artisanal fishermen are based on the sharing system. Through this system, the boat/gear owner receives 50 percent of the shares while the remaining catch is divided among the fishermen.

The funding of the fishing operation is done through the money lending locally called "avio", through which the fish trader takes care of the fishing expenses and the costs are deducted from the total value of the catch.. The boat owner, in general a broker, gives the fisherman an

advance to cover the subsistence needs of the family he leaves behind. The fishers, on their part, agree to sell the entire produce at a stipulated price, which is much lower than the market value. In this system the fishers are totally dependent on the broker financing them.

Some government programmes were established in the region to overcome the traditional funding for fishing operations. Fish workers have coordinated with farmers, those involved in extracting, and other segments of producers from Gritos da Terra to obtain subsidised credit for fisheries. The result of these negotiations has been the creation of lines of financing for social development, like the special FNO Crédito Produtivo (Productive Credit). This state government finance programme that offers small credits has also taken to financing production equipment such as boat, nets, motors etc.

PEP (Professional Education Program) is an interesting programme that has been introduced with the help of the Labor Ministry. Hundreds of short training programmes were carried out in fishing communities on methods of fish processing, fish capture and handling techniques. In spite of the lack of opportunities for the practical application of what was learned and the lack of continuity in the programme, this was perhaps the first effort on the part of the government to educate fish workers on the finer aspects of their jobs. (Barbosa, Lima and Maneschy, 2000)

Marketing:

The fragility of the on board storage, transportation and marketing systems is the cause of a very high margin of loss or damage to the product.

To improve the marketing system the Federal Government planned and is executing a program for the construction of fishing posts in Belém and in San Luis, financed by the BID (Interamerican Development Bank). This program also includes the construction of intermediary posts in some points in the coast, as well as the acquisition of boats and fishing gear. However, many of these facilities, such as ice factories and cold storage rooms, instead of benefiting small-scale fishermen, as planned, fell under the control of private firms and fish traders.

6.2 NORTHEASTERN REGION

Geographical characteristics

The Northeastern region begins in Foz do Parnaíba (Piauí) and ends in Cabo Frio, in the state of Rio de Janeiro. This region is a narrow continental platform with large areas of reefs containing corals and calcareous algae. Owing to the type of seabed, the trawling techniques are limited. It is a region with many large sandy beaches covered by palm trees, with a semi-arid climate and quite regular wind conditions. The coast is not very jagged and rarely offers safe harbors for the boats. From the Cabo Calcanhar onwards, appear reefs running parallel to the coast till near Recôncavo Baiano.

Picture 4 – Sailing boats of artisanal fishermen in Northeast

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Given the geographical situation, a raft which was specifically adapted to these conditions, the 'jangada' was developed by the locals. It is a simple construction (wooden with sails) and is highly stable, with the ability to berth on any type of beach and to sail above the reef barriers. Of late, the difficulty in finding wood for its construction has restricted the replacement of these rafts. Besides these, there are a large variety of boats used in this region, such as the canoes used in lagoons and inlets, sail boats, motor boats etc.

The species of maximum importance in artisanal fishing are lobster, mackerel, sawfish and dogfish. In 1997, the regional yield was 188,023 tones that are 20% of the total produce in Brazil. Around 70% of the production is from maritime fishing.

Picture 5 – Raft fishermen in the Northeast

Picture 6 – Beach seining in Bahia coast

Artisanal fishing is of great importance in this region, in 1995 it accounted for 84% of the total production. Industrial fishing concentrates on lobster and the lane snapper.

The estuarine production is drawn from the inlets, bays and lagoons with the help of gear such as encircling nets, beach seines, and long lines. The most harvested species are the catfish and crab. In some states there is a special type of fishing in "ponds" an incipient cultivation technique in which the young hakes are trapped in the estuaries where they grow. They manifest high productivity (around 1 tone per hectare) and need small investments. These, however, are threatened by environmental degradation.

Another technique used is the "caiçara" (brush park made of branches put into water to attract fish), in the lagoons of Mandaú and Manguaba, in Algoas, where the branches are deposited into the bottom to attract hakes that are bred there and later become fish. Among the estuarine species worth mentioning are the caranguejo-uçá (Ucides cordatus) a variety of crab, captured mainly in Sergipe, Pernambuco and Bahia; it is an alternate source of income for a large number of poor fishers and their families.

Coastal fishing and fishing in the continental platform exploit the highly fertile and less productive ecosystems of the continental platform. Rafts and sailboats are used to exploit these isolated regions in the coast. The major species captured are mackerel, sawfish, flying fish, and sword fish (pelagic). Among others are the lane snapper, grouper, giant croakers etc. besides the lobster.

Organisation of Fish workers

In the northeast there are 273,315 fish workers, this being more than the total number of artisanal fish workers in Brazil, of whom, 104,759 are organised into 157 Fish worker Colonias – Maranhão (30,476) and Bahia (24,174) are the states which have a higher number of artisanal fish workers. (See table 6)

Main obstacles in the development of fishing:

1) Restriction on the expansion of fish yield. Unlike the Northern Region, the Northeast has already achieved maximum sustainable yield, with little possibility of an increase in the physical volume of production. In this sense, the regulation to reduce fishing activity takes on a special dimension. The regulatory measures, in general, affect the artisanal fish workers more, who have very low income levels. Any step that implies a further reduction in their income, is, in general, favorable to industrial fishing, and is not accepted voluntarily. In many cases the necessity arises, to create employment outside the fishing sector, in integrated rural development projects.

2) The marketing structure is heavily controlled by middlemen. The existing system allows the profit of the intermediaries to be excessively high while the income of the fishers remains very low.

3) Administration of the Colonias by non-fishers. The patronage system, through which small-scale fishermen are dependent from middle-men, hinders a democratic representation of fishermen in the guilds.

4) Degradation of the coastal environment. Rapid urbanisation, uncontrolled development of tourism and the location of industrial belts in estuaries and other rich ecosystems, has led to a decrease in the natural productivity of the ecosystems and of fishing itself. Alternatives such as coastal aquaculture are threatened by the contamination of the waters. A very serious source of pollution of these ecosystems are the alcohol production units which produce toxic wastes

("vinhoto") a major part of which is directly disposed off into the estuaries. This phenomenon is very serious in states such as Pernambuco and Alagoas. Offshore petroleum drilling also poses a high risk to the coastal environment from Sergipe to Bahia. On the other hand, highly productive lagoons such as the lagoons in Mundaú and Munguaba (Alagoas) as well as important bays, for example the Salvador Bay, are being threatened by the dumping of toxic wastes into the waters (Figure 3)

5) Lack of Capital. Although the region has benefited from the credit financing programmes of PROBID, the lack of cash capital and capital for replacement of gear is a serious constraint for small-scale fisheries development.

6.3. SOUTHEASTERN/SOUTHERN REGION

Geographical Characteristic

It comprises two regions: the Southeastern, from Cabo Frio to the Cabo Santa Marta in Santa Catarina and the Southern Region from Cabo Santa Marta to the southern border of Brazil (Chuí river). The two regions are similar from the oceanographic point of view. The continental platform has a muddy bed, allowing for trawling in a large part of its area. In the south of Brazil appears the Malvina Current, creating a tropical convergence responsible for a considerable increase in the natural productivity.

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Picture 7– Canoes of artisanal and sardine industrial fishing boats

The Southeastern Region (the state of Rio de Janeiro, Espírito Santo and São Paulo) has, according to FAO a maximum sustainable yield of 275 to 300,00 tones/year. In 1997 catches reached 162,885 or 22% of the national harvesting. On the other hand, artisanal fishing contributes to only 22,5% of the total yield. From Rio de Janeiro towards the south, artisanal fishing loses its importance in relation to industrial/firm based fishing, which is responsible for around 77.5% of the capture (1995). This owes, not only to oceanographic and biological factors (trawling facility, large biomasses of pelagic fish) but also to the incentives given to fishing industries by SUDEPE after 1967. The Southeastern/Southern region absorbed more than 90% of the total of fiscal incentives.

The southern region shows the highest fish yield in the country, with 30% of the total yield in 1997. Artisanal fishing contributes only 18% to the total marine catches.

The main fish resources exploited are the shrimp reserves (white shrimp and camarão sete-barbas, plain fish, weak fish, catfish and small anchovies. Apart from the camarão sete-barbas many other species are harvested in bays and estuaries where regional artisanal fishing is concentrated. Out of the resources exploited by artisanal fishing, only the camarão sete-barbas achieved its estimated maximum sustainable yield.

Picture 8 – Baleeira of Azorean fishermen from Santa Catarina

Two of the largest estuarine complexes in the country are located in the Southern and Southeastern regions: the Iguape-Cananéia, in São Paulo and the dos Patos lagoon Rio Grande do Sul. Besides this there are smaller estuaries spread out in the region.

In spite of the potential that small scale fishing has, fishers complain of the continually depleting reserves. Some studies, point out, though, to the possible misuse of the coastal resources and to the effects of sea pollution, that would be more damaging than an increase in fishing activity per se.

In fact, a large number of the estuaries have serious problems of environmental degradation, as for example, the Dos Patos lagoon, an important fish nursery near which the Southern Petrochemical belt is located with numerous chemical industries, cellulose paper factories, tanneries etc. (Figure 3)

Organisation of Production and Technology

The southeastern region shows a reduced number of registered artisanal boats (2,855), around 6% of the total number in the country, 30% of them being motorised (the largest percentage of the country). The Southern Region has 16,744 boats, of which only 3.5% of them are motorboats. These non-motorised boats operate mainly in the estuarine regions.

The Santa Catarina and Rio Grande do Sul region has a better organisational structure owing to the presence of experienced Portuguese and Azorean fishers, who migrated to Brazil.

In that region there is also a dynamic artisanal sector comprising fishers who utilise boats of Portuguese origin "baleiras" and are mainly involved in shrimp fishing.

While in the coastal zone, the motorboats use small shrimp trawls and set nets for fish, in the coastal estuarine areas a large variety of gear such as encircling nets, trammel nets and beach seines are used.

Picture 9 – Artisanal fishermen from an island in São Paulo coast

Organisation of Fishing

There are a variety of sharing systems between members who participate in the fishing activity. In motorised fishing, after putting aside the expenses for food, ice and fuel, the catch is divided by half between the owner of the fishing equipment and the workers. In lagoon fishing, according to the traditional system 1/3 of the production goes to the fishers and two thirds for the proprietor of the gear when he participates in the fishing.

The marketing system has been modified a lot in the last few years with the proliferation of companies, which buy the yield from the fishers through the fish vending posts. In some cases the role of the middlemen is still important although in this region there are cases of success in the operation of cooperatives.

Organisation of Fish workers

In the Southeast/Southern region there are approximately 180,760 artisanal fish workers, of whom half are members of the Colonias. Santa Catarina and Rio de Janeiro have the maximum number of artisanal fish workers in the country (Table 6)

Main problems in the region

Conflict with industrial fishing which infringes into the coastal areas and estuaries; tourist invasion and purchase of land in beaches and areas where artisanal fishing is carried out; environmental deterioration due to the presence of big industrial centers; lack of organisation of the fish workers.

7. Social and institutional organisations of the artisanal fish workers

7.1. ARTISANAL FISHING INSTITUTIONS

Artisanal fish workers are organised into 'Colonias', similar to the Iberian guilds, created in the beginning of the century by the Brazilian Navy. The objective of the creation of these "colônias" was to organise the fish workers spread out along the coast as reserves for the Navy. The

directors of the Colonias are elected by the fish workers who are legal members, and they in turn elect the president of the Provincial Federation. The president of the National Confederation was personally nominated by the Agriculture Minister, to which the fishing sector was institutionally attached till1989.

Until the 1988 Constitution, a majority of the directors of the colonies were, representatives of other social and professional sectors, such as fish traders, lawyers who utilised the fish worker organisations for political purposes. In 1973 a new statute was established for the Colonias, but no substantial changes occurred. As this new law was promulgated during the military regime and there was no consultation whatsoever with the fish workers.

In the beginning of the 80's, for the first time the artisanal fish workers of Pernambuco (Northeast) organised mass meetings against the environmental degradation of the rivers and estuaries, caused by the large sugarcane mills. The movement to re-democratise the country, towards the end of the military dictatorial regime, had an important influence on the democratisation of the electoral process, principally in the Northeast, where the Pastoral dos Pescadores (Pastoral of Fish workers), created by the Conferência Nacional dos Bispos de Brazil (National Conference of Bishops of Brazil) played an important role. After 1986 the Movimento pela Constituinte da Pesca was organised, where, for the first time, the artisanal fish workers could express their demands in the National Congress: free and democratic association, end to fiscal incentives for industrial fishing, labor rights, recognition of women's work, development programmes, control of environmental degradation etc.

In 1989, with the declaration of the Constitution, the Movement phased out, but MONAPE – National Fishworker's Movement- was created, with a base in the artisanal fish workers of the country.

The main challenge for MONAPE is the stimulation of an independent and democratic organisation of artisanal fish workers, seeking to maintain the rights earned by the 1988 Constitution and fight for new social and labor rights. The MONAPE has organised various national meetings of its members, also inviting representatives from organisations of fish workers from neighboring countries, like Conapach, in Chile. The MONAPE is active only in the northern regions, where its base is and in some states of the Northeast. Unfortunately, in the 10 years of its existence the MONAPE has not succeeded in establishing itself as a national movement capable of offering alternatives to the existing institutional framework that, as mentioned before, is marked by protectionism and the lack of clear and effective policies favoring artisanal fishing.

Till the Constitution of 1988, fish workers were allowed to organise themselves only into traditional colônias whose role was mainly one of social services. The new constitution allowed fishermen to create their own trade unions, although few of these unions were established effectively. In the 80's, the Pastoral de Pesca, linked to the Catholic Church, began the work of securing the rights extended to other workers, for fish workers, such as retirement benefits etc. Today it is possible that these fish workers inscribe themselves in the National Institute of Social Security, as autonomous workers and pay a contribution, till retirement at 60 years for men and 55 years for women. They can, according to the Organic Law of Social Security, apply for retirement on grounds of health problems, health benefits and maternity allowances. In the regions in which suspension of fishing activity for some months is enforced for the regeneration of species, the fishermen associated to the colônias receive an allowance to compensate for the period without fishing.

According to Barbosa, Lima and Maneschy (2000) thee inclusion of fish workers in the 'special insurance' category of pensions and social security can be considered a major victory of the fishermen social movements. Provisions such as these mean that men can receive pensions and other benefits, which though limited, are part of any citizen's rights. Also important is the unemployment insurance for riverine and inshore fishers, though this has been restricted to those places where 'closed areas' have been instituted for the reproduction of fish stocks.

7.2. THE ROLE OF WOMEN

In different regions of Brazil, mainly in the Northeast and the North women have traditionally participated in fishing as "marisqueiras" (shellfish collectors), "pescadeiras" fishing in the seashores and in the processing of fish, be it artisanaly or in industrial fishing.

Until the1988 Constitution, women were not legally permitted to work in fishing, due to the fact that it was considered a male activity. Before this, the SUDEPE only allowed women to work as collectors of shell fish or algae. It was only in 1988 that a Presidential act abolished the prohibition on female labor in fishing.

Picture 10 – Women collecting shells in São Paulo southern coast

In spite of the legalisation of their role, women rarely participate in deep-sea fishing, as the fishermen consider that their presence in the boat brings bad luck ("panema"). This situation is slowly changing and in some states of the North and the Northeast, some women work with the families in small-scale fishing. There are also cases of widows who work alone in artisanal fishing boats. Some of these women are now even presidents of fish worker colonies, but these are still isolated cases.

The majority of women work as "marisqueiras", collecting shellfish during the tide and selling the yield to increase the domestic income. In some states of the Northeast, as Bahia, the "marisqueiras" around 20,000 in number participate actively in the earning of the domestic income. In states such as Maranhão, women participate in fishing "on foot" with small shrimp nets. The shrimp is brined, dried and sold by the women. This activity isalso common in other states of Brazil.

The activity of women is also important in some fish worker communities, where they weave and darn the fishing nets. In many other communities women work in small-scale agriculture, producing yucca flour, which is the basic diet of the coastal populations.

Urban industrial employment is another field where women are active participants, working in the fish processing industry. In many cases the work force is almost entirely female.

According to Barbosa, Lima and Maneschy (2000), in the Northern region, women participate in fisheries in various ways: the fish in shallow waters close to home though they do not fish at all when pregnant or menstruating, giving in to social and cultural pressures. Most of the times the product is meant for sale, as is the case with shellfish harvesting in the mangrove swamps and beaches. But sometimes it is used for domestic consumption and distribution among a network of relatives. Among other activities related to fisheries, women engage in the making of fishing gear and in fish processing. The absence of regular buyers, low prices and delays in payment are the common problems they face.

Women from coastal communities too had a more regular and active role. Records reveal that in the era of sail boats, fishing used to be carried out much closer to the land as there were more fish there. With the introduction of motor boats around the beginning of the 70s, and with the advent of the industrial fleet, pressure mounted considerably, making it necessary to go out much farther into the sea, for longer periods. Thus it became difficult for women to participate more fully in open sea fishing.

Women who continue to take an active part in fishing are still accorded the status traditionally given them. Their activities are viewed as 'support' for the running of the household. A majority of the colônias follow the traditional sexual division of labor. The 'double-workday' of women continues to be thought of as 'part time activity'. A woman involved in the administration of the colônias is still considered a little 'out of place'.

In the state of Pará has been witness to a new trend over the past five years. In Pará, over 10% of the registered members of the colônias are women. They are seeking alternatives to traditional set-ups like the colônias. Several women's associations have mushroomed where women hold positions of importance.

There have been several motivating factors behind this new beginning. The attempt to generate income, and explore alternative avenues to do so, is one important reason why women have united to form associations. Government programmes and the initiatives of non-governmental bodies directed at small producer groups have also influenced these women's organisations. Groups that already existed in the community – mostly linked to the Catholic Church (Mothers' Clubs, CEBs or Grassroots Ecclesiastical Communities) – are enthusiastically supporting these new associations. Where the colônias have opened up and admitted women, integration has followed naturally. Once groups are formed, the exchange of ideas and access to new social spaces has meant a reconsideration of traditional roles. Such groups tend to follow examples set by other organisations that have been successful in welcoming women into their fold.(Barbosa, Lima and Maneschy, 2000)

The role of women in fishing was highlighted, in the 90's by the Pastoral da Pesca, Monape and by NGO's, such as Terramar (with the support of the International Collective in Support of Fish workers) (Maneschy. M, 1999) who organise specific reunions to discuss the problems and the potential of women in fishing.

8. Social movements and institutional arrangements for coastal management.

Since the middle of the 1970's public concern for coastal conservation has gathered momentum in Brazil. Some of the factors that explain this rising concern are:

(a) The growing awareness of the Brazilian society on the ecological importance of the coastal area and on the increasing degradation of its ecosystems. The position of the Brazilian Government at the Stockholm Conference in 1972 that "Brazil welcomes polluting industries" has changed since then, because of the pressure of non-governmental organisations, International Institutions and mainly because of the growing awareness of the population concerning environmental issues. In the 1970',s despite the presence of an authoritarian military regime favoring industrialisation at any social or ecological cost, many environmental groups were created. In the last years of the military regime (until 1984) national campaigns were organised by environmental movements on issues such as the destruction of the Amazon and Atlantic Forests, the Pantanal, pollution in urban centers (such as São Paulo and Rio de Janeiro), and the establishment of nuclear plants along the coast. Hundreds of small groups blossomed to oppose whale-hunting, tree cutting in urban areas and destruction of national parks. Although many of these groups, formed by the middle class, were urban biased, they were instrumental in raising the level of environmental awareness. They succeeded in electing a few representatives in the state legislatures of the more urbanised states such as São Paulo, Rio de Janeiro and Rio Grande do Sul. In 1986, some candidates with strong environmental concern were elected to the National Congress that developed the 1988 Constitution. And for the first time, specific considerations of the conservation of coastal ecosystems were included in the Constitution.

In the "Cadastro Nacional de Instituições Ambientalistas - Ecolista - a roster published by WWF/Mater Natura there are 1.400 Environmental NGO's registered, from which 296 were created in 1991-1992. From those which answered the research undertaken by the Cadastro, around 6O of them, or 14.7 % deal exclusively with coastal/marine ecosystems. If 504 NGO's dealing with the Atlantic Forest are added, one could say that around 61 % of the Brazilian NGO's are, in one way or another concerned with the conservation of the various marine ecosystems.. A large group of them are located in the Northeast (30.0%)

From the NGO's dealing exclusively with coastal/marine ecosystems there are those which deal with species or ecosystems conservation, such as SOS Mata Atlântica (Sao Paulo) Tamar, (Bahia) that protects turtles, and Peixe-Boi (Manatee) (Pernambuco) Projeto Mamíferos Marinhos da Bahia, Clube de Observadores de Aves (Rio Grande do Norte). There are also socially oriented NGO's, dealing specifically with traditional populations and their environment, such as Terramar, Sociedade Civil Mamirauá, Sociedade Civil São Sebastião Tem Alma, Fundação Josué de Castro, etc.

At the society level, a socially oriented environmentalism gained importance vis-à-vis the traditional environmentalism that was interested mainly in species protection. This new environmentalism was able to establish alliances with other social movements, political parties and local movements.

(b) The increasing number of public institutions dealing with environment conservation By the end of the military regime, a public space had been opened for environmental issues. Secretariats for Environment were established in many Brazilian States. At the Federal level, SEMA - Special Secretariat for the Environment (created in 1973) and later (1992) the Ministry of the Environment has been designated as core agencies for environmental protection.

(c) The importance of the environment was also highlighted by a growing number of University and Government research centers. Well-known Oceanographic institutions, such as the Oceanographic Institute of the University of São Paulo, the Undergraduate Course on Oceanography in Rio Grande, Labomar, in Fortaleza, Labohidro in São Luís, the Schools of Fisheries Engineering in Recife and Fortaleza have contributed to increase the knowledge on coastal/marine ecosystems. Some other research institutions linked to Universities, such as Nupaub- Research Center on Human Populations and Wetlands of the University of São Paulo, have also cooperated in increasing the knowledge about the relationships between local communities and coastal ecosystems. Nupaub has produced the first inventory on the Brazilian Wetlands, (1994) disseminating the knowledge about coastal habitats and their human population.

8.1 THE ROLE OF THE STATE, OF NON-GOVERNMENTAL ORGANISATIONS AND LOCAL INSTITUTIONS IN COASTAL MANAGEMENT.

Coastal conservation and management became an important issue in Brazil in the late seventies and in the eighties when the impacts of the industrialisation and urbanisation resulted in a rapid degradation of the coastal environment. Artisanal fishermen started a movement in the Northeast against the pollution of estuaries and rivers caused by the acid waste of the alcohol producing distilleries. It was the starting point for a stronger organisation of small-scale fishermen, supported by the Catholic Church and some Non-Government Organisations. This social process indicated the emergence of new identities and social awareness among coastal communities and artisanal fishermen communities. These identity-building processes often occurred during conflicts that opposed these communities to urban expansion that often resulted in the expulsion of artisanal fishermen from their beaches and adjacent coastal waters. In tropical countries, where warm, sandy and sunny beaches became valuable assets to national and international tourists, artisanal fishermen and their activities are seen as obstacles to a free development of the market forces. Artisanal fishermen and local dwellers are resettled into the corner of their own beaches transformed into tourist resorts. In some other cases, the establishment of large industrialisation projects resulted in high levels of marine pollution, destruction of valuable habitats, such as mangrove and ultimately led to the social disruption of artisanal fishermen communities. In many cases, the social reaction against these processes led to the establishment of new and politically orientated social movements of artisanal movements, such as the National Movement of Fishermen - (Monape), in Brazil.

8.2 THE BRAZILIAN COASTAL AREA MANAGEMENT PROGRAMME

In the late 1970's, government institutions have been created at federal, state and municipal level to deal with environment conservation. The first federal institution was SEMA, Secretariat for the Environment, created in 1973 and incorporated by the Ministry of the Environment and Legal Amazon, created in 1992. In 1989, IBAMA, - Brazilian Institute for the Environment- was created and incorporated to the Ministry of Environment. Since the 1970's most States have created their own Secretariat for the Environment, and more recently many municipalities are creating their own environmental institutions. In 1981 the first comprehensive national law on the environment was promulgated although the first legislation on environmental issues in Brazil was established in the 1930's. CONAMA, the National Council on the Environment was created, with the participation

of Governmental agencies and NGO's and it is responsible for the main policies concerning the environment. In 1986, CONAMA approved the first legislation requiring environmental impact analysis for large projects.

The 1988 Constitution has declared the Atlantic Forest and its coastal zone as one of the five crucial areas for management and sustainable development.

Brazilian Government and Non -Government Organisations have actively participated in the UNCED-92, in Rio during the various discussions on the issues of coastal/marine environment that produced Chapter 17 of Agenda 21. The text of the Agenda 21 was published in Portuguese in 1995 by the Parliamentarian Commission on Consumer's Protection, Environment and Minorities of the National Congress. According to the text of chapter 17, the Governments have agreed on a series of measures that, if implemented, should lead to the sustainable development of the world coastal/marine areas.

Also NGO's, such the National Forum and Monape -National Movement Fishermen of have participated in drawing up a Fisheries Treaty, signed by Non-Government Organisations during UNCED 92

Brazil also signed the UNCLOS - Law of the Sea- in November 1982 and ratified it in December 1988. In January 1993, the Brazilian Congress has decreed Law 8.617 in which Brazil defines the 12 miles territorial sea and the 200 miles of Economic Exclusive Zone. Since 1988, the Interministerial Commission for Marine Resources has established the Project Leplac, collecting geophysical data to define the limits of Brazilian EEZ. Through the Revise Project - (1994-1998) - Assessment of the sustainable potential of sea resources-, the same Interministerial Commission is surveying the existing biomass and the allowable catch for each species in the framework of the Law of the Sea. In this process, this Commission has established research agreements with the main Oceanographic Institutes and other marine institutions to collect and evaluate the necessary information.

In order to coordinate the various researches on marine resources, the Government has established in 1974 the Interministerial Commission for Marine Resources (CIRM). CIRM's main responsibilities are the promotion of research and the rational management of marine resources. The Commission was formed by representatives of eight ministries (Navy, Foreign Relations, Agriculture, Transport, Education, Industry and Commerce, Mines and Energy, and Interior) and the Planning Office and the National Council for Scientific and Technological Development. In 1979, a Secretariat was established (SECIRM) and was chaired by the Navy.

8.3 COASTAL MARINE PROTECTED AREAS: MARINE EXTRACTIVE RESERVE

The establishment of protected areas is one of the main Government policies concerning coastal ecosystem conservation. The creation of protected area is under the responsibility of IBAMA (Brazilian Institute for the Environment) and the State Secretariats for the Environment. There are 28 of these protected areas, covering several coastal and marine ecosystems such as coastal and oceanic islands/archipelagos, dunes, mangroves, lagoons and salt marsh habitats. A recent study on coastal/marine-protected areas has shown that there is a low level of management due to lack of management plans, of legislation enforcement, technical and financial means and research.

A major reason for the low conservation achievement however lies in the way these protected areas are established, without previous consultation with users groups, and traditional populations in particular. These groups, according to existing legislation must be transferred from the places where these protected areas are established. It is known, however, that these traditional communities have used these ecosystems with a low level of impact on flora and fauna and should be considered as important allies in the conservation process. As these areas are created mainly by federal and state agencies, local municipalities are excluded from the decision and therefore give little support to these important conservation areas.

In recent years, a new category of protected area was established: the marine extractivist reserve through which a marine area is assigned to the exclusive use of a certain number of

small-scale fishermen. A management plan is agreed upon by a grass-root institution that assembles the fishermen of the extractivist reserve. Some six marine extractivist reserves have been officially established by the National Council of Traditional Populations (CNPT- IBAMA) and several others are in the process of being created, particularly in the North and Northeast regions (Figure 5).

Employing a framework that restricts access to, and economic uses of coastal sea space offers Brazil a way to begin to control the highly destructive, still basically unmanaged, development of its extensive coastal zone (harboring a wide range of habitats of high conservation value, not only coral reefs), while at the same time reinforcing the resource-use rights and territorial claims of local communities to the micro-environments of small-scale fishing.

The Marine Extractive Reserve is essentially an effort to modify and extend the concept of 'extractive reserves' – a conservation and sustainable development framework successfully instituted in western Amazonian forest (primarily rubber-tapper) economies – to coastal aquatic and marine domains of traditional fishing communities (CNPT 2001; Cunha 1992; Diegues 1999, 2001). By taking into account how environment and society both stand to benefit from helping the coastal poor secure continuing access to their traditional sea territories, and livelihood resources, Brazil's Marine Extractive Reserve is a radical departure from conventional approaches to setting up and managing Marine Protected Areas (MPAs). In the past most MPAs were established opportunistically, or, more recently, almost solely on the basis of biodiversity criteria.

Figure 5 – Location of Marine Extractives Reserves in Brazil

The Marine Extractive Reserve initiative is exceptionally promising; it has the potential to unify and reconcile elements that all too often are seen as incompatible: traditional culture heritage and cultural resource preservation needs, sustainable local fisheries, and conservation of marine biological diversity.

Various provisions of national environmental legislation (namely Lei No. 9.985 / Article 225 of the Constitution instituting SNUC, Sistema Nacional de Unidades de Conservação da Natureza, Capítulo III, Art. 14, IV); civil codes; and international treaties to which Brazil is a signatory (e.g. Articles 8j, 10c,10d of the Convention on Biological Diversity) endorse the principles on which collectively- held, marine extractive reserves are based, along with CNPT's-National Center for Traditional Population mission (Portaria IBAMA No. 22 / 2-10-92). However, it remains to be seen whether protected areas can be implemented and effectively managed on a scale broad enough to have biologically significant impacts is problematic. Basic questions remain concerning the social feasibility and economic viability of the Marine Extractive Reserve.

To successfully institute a network of Marine Extractive Reserve sites, CNPT also faces a major challenge in dealing with federal, state, and municipal jurisdictional conflicts, inconsistent policies and legislation across sectors, and the need for greater institutional coordination and cooperation in managing marine and aquatic resources within the environment sector as a whole . (Cordell, 2002)

8.4 LOCAL EXPERIENCES IN COMMUNITY COASTAL MANAGEMENT.

While coastal management planning and implementation has, in general, remained a technocratic exercise without a major impact, in some areas coastal communities are doing their own coastal management. In Ceará, for instance, local communities are suffering from the invasion of their beaches by land speculation, tourism and from over fishing of lobster, mainly by the industrial fleet and by divers coming from a neighboring state. Assisted by local NGO's and research institutions, they have proposed a Coastal Forum, where the various problems are discussed by representatives of local communities, tourism sector, the industrial fisheries sector and the federal, state and municipal governments. Within this forum they have proposed a management plan for lobster fishing, also in coordination with the industrial fisheries sector. When IBAMA announced that no funds and boats were available for surveillance of lobster fishing, they equipped one of their boats in order to ensure the compliance with the rules that regulate that fishery. The fishermen that disobey the regulations are first reprimanded and when they violate the agreed legislation again, they are taken to a court.

In some beaches, the selling of a plot of land to tourists must be approved by the community council

In some other coastal communities, such as Pirajubaé in Santa Catarina, Mandira-Cananéia in São Paulo and Arraial do Cabo, in Rio de Janeiro, extractivist reserves are being built in order to ensure access to fisheries resources for the members, and limit the access to outsiders, mainly to sport fishermen. In most of their initiatives, there is a strong resource conservation component, and as result they frequently succeed in getting the support of government and non-government environmental organisations.

9. Final considerations

On the most serious constraints for small-scale fisheries sustainable development is the absence of Government policies for the whole fishing sector.

The only attempt to evolve a strategy for the development of the artisanal fisheries sector was done by SUDEPE, through the PESCART – Programme of Assistance to Artisanal Fishing established in 1973.

What characterised SUDEPE in the last 20 years (1967/87) in relation to fishing policy was, the priority given to the industrial/company based sector, with its policy of fiscal incentives established by Decree 221 in 1967. Undermining the importance of the artisanal sector, the SUDEPE opted for the establishment and strengthening of fishing companies with businessmen

who frequently did not belong to the fisheries sector. This model, which was capital and technology intensive had mediocre results, with the over-fishing of the limited tropical fish resources..

Artisanal fishing, between 1973 and 1988 had received only 12% of the equivalent of funds invested in industrial fishing through fiscal incentives and ended up, to a large extent, reduced to being a mere supplier, be it of cheap labor or of fish production for the fishing companies.

The focus of PESCART was the "Technical Assistance" provided by fisheries engineers the majority of whom narrowed the term "development" to mean new capturing and processing techniques.

Although limited in scope and results, PESCART was the only small-scale fisheries programme and was discontinued when SUDEPE ended its operation in 1988, when its responsibilities were handed over to IBAMA. This environmental institution was preoccupied only with fisheries regulations and law reinforcement, leaving aside any strategy related to fisheries sustained development and the well being of fishermen.

One of the few attempts on the part of the IBAMA to support artisanal fishing was the organisation of extractive reserves in mangrove forests and estuaries for the exclusive use of the artisanal fish workers. But again, there is no clear policy and funding strategies for the operation of these important extractive reserves.

In 1998, a Fisheries Department was created under the Ministry of Agriculture, but its main concern has been with the leasing of foreign boats for tun an industrial fishing and not with artisanal fisheries. This lack of policy for small-scale fisheries is part of the general neo-liberal policy of the Government through which the market could solve all the social and economic problems.

In spite of the worsening of the economic and social problems of the fish worker communities, some positive signs were noticed in some States.

a) The creation of departments to promote fishing by the provincial and municipal governments, thus creating structures more flexible to solve problems at local / levels.

b) The initiatives, although spread out, of some non-governmental organisations to organise the artisanal fish workers.

c) The movement of the Constituinte da Pesca and the creation of MONAPE has mobilised the artisanal fish workers of Brazil around common issues;

d) The success, in some states, in the organisation of free elections for posts in the administrative council of the Fish worker Colonias. These new councils free from the influence of individuals not belonging to the sector, need technical and financial support to design and implement programs to promote artisanal fishing and to achieve concrete results in bettering the situation of the fish workers.

Keeping this in mind, it is necessary to create options which address the local situation, within the range of possible use of resources, technology and organisational forms, keeping in mind the following four criteria:

a) the social criteria for the distribution of incomes
b) the ecological sustainability
c) the effective use of energy
d) the economic viability

In the present situation in Brazil, keeping in mind the obstacles in the development of sustainable artisanal fishing, described above, alternative strategies should be based on:

1) The creation and the strengthening of to new forms of associations of fish workers, free from the patronage of the government and it's institutions (Ministry of Agriculture, Marine Resources etc.) These associations (guilds, unions etc.) must have their Councils elected freely, at the local, municipal, state or national level.

2) Support to civil associations, such as NGO's, MONAPE – The National Movement of Fish workers, Pastoral da Pesca as well as to new initiatives such as extractive reserves, local tourism in fish worker communities etc.

3) An effort towards the social mobilisation of the fish worker communities with the objective that they regain confidence in themselves as agents of development. One of the objectives of this mobilisation is the creation of new leaderships substituting the traditional roles, many a time exercised by people who are outside the sector, such as traders, councilors etc.

4) The expansion and reinforcement of marine extractive reserves could be the core of a new strategy, as artisanal fisheries areas could be free of the incursion of industrial boats and from land speculation.

5) The need to integrate traditional knowledge and management in the contemporary management systems. This integration will foster the actual participation of fishermen in the planning and implementation of the extractive reserves. Traditionally knowledge, associated with scientific methods could be a sound basis for local fisheries management.

6) A new conception of integrated projects which respects the complementary action of the diverse economic activities carried out by the fish workers (agriculture, fishing and artisanal extraction etc.) Thus, the projects in areas where the traditional complementary relations are maintained will ensure that the fishers are not solely dependent on fishing. Some experiences in Ceará and São Paulo show that the combination between fisheries and local tourism may be successful.

7) A new conceptualisation of "technological innovation" which is not restricted only to fish harvesting, an increase in which can lead to over fishing, but also to the whole range of the activities related to production, processing and marketing. These innovations must not only be technologically viable, but must also be ensure positive results for all artisanal fish workers and not only to middlemen.

8) The real participation of the fish workers in the regulation of the use of natural resources (fish, mangrove vegetation etc.) The fines imposed on the damaging parties must be included to benefit the integrated programmes for resource management controlled by the communities.

9) Marketing systems which involve the substitution of the middlemen, starting from an analysis of their traditional patronage role they play. Complex marketing systems should be avoided, such as vertically organised cooperatives. As and when possible, direct marketing should be encouraged, above all in communities close to tourist facilities.

10) Among the new alternatives, priority must be given to activities linked strongly to fishing, such as mariculture in the coasts. This, especially in its initial stages must not be a specialised activity and must be developed as a supplement to the income from fishing within the local environment. Experience, such as Mandira oyster management project, in Cananéia-SP shows that the establishment of extractive reserves can be an important strategy both for production and commercialisation in coast artisanal communities.

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TRADITION AND CHANGE IN BRAZILIAN FISHING COMMUNITIES: TOWARDS A SOCIAL ANTHROPOLOGY OF THE SEA

Antonio Carlos Diegues

Concepts and methods employed in the analysis of peasant societies are commonly used in the study of relationships between human communities and the sea. While some concepts, such as agricultural cycles, partnership, community work, and rural wage earning are helpful in the study of those human communities which combine agriculture with fishing in closed coastal environments such as estuaries and mangroves, they cannot adequately account for the complex relationships between fishing communities and the ocean. This is especially true for fishing communities with a long maritime tradition, with well-developed social, economic and cultural systems related to the sea which increasingly differentiates them from land communities. Although more evident in some European and Asian communities with a great maritime tradition, this distinction is also noticeable in some Brazilian fishing villages. The analytical problem here results from the establishment of the social, ecological and cultural identity of the human communities which make their livelihood from the sea, in contrast with those making their livelihood from the land.

In response to this problem, new disciplines such as maritime anthropology and sociology have recently appeared, which are attempting to define the specific features of maritime human communities that set them apart from land-based ones. Maritime anthropology/sociology centers have recently appeared in Canada, France, and the Netherlands. The department of Anthropology at Laval University in Quebec City is home to a group of anthropologists with a long tradition of research on fishing communities (For example, see Breton 1981). The Center of Ethnotechnology in Aquatic Environment, founded in Paris in 1970 by three researchers in the human sciences, and currently located at the National Museum of Natural History, brings together researchers studying the different features of fishermen's lives to collaborate on methods, guidelines and information. It assembles mainly anthropologists, ethnologists, sociologists and historians engaged in on-going research. In Amsterdam, researcher in this area is being conducted at the Journal of Maritime Anthropological Studies (MAS), launched in 1988.

Brazilian studies on fishing communities have increased in number and seen some changes in the last few decades. This author has previously identified three distinct phases in an earlier review of social scientific studies of sea-based fishing communities (Diegues, 1988). The first phase, during the 1950s and 1960s, was characterized by studies on fishing folklore or includes research on socially homogeneous communities and their traditions. Since the early 1970s, researchers have begun to consider fishing and fishing communities in the wider context of the nation and economic structures, and as related to the penetration of capitalist relations in this sector and the conflicts between traditional mode of fishing production and the capitalist one. In the early eighties, researchers had begun to develop a sociology and especially an anthropology of the political economy of maritime communities. These emerging fields examine the unique features of fishing communities and the relationship between them and their particular habitat - the sea, as well as their values and ideology resulting from their relationship with nature, on the one hand, and local and national societies, on the other.[2]

In their analysis of different ways that fishing communities interact with their environment, maritime sociologists and anthropologists have identified two "ideal types" of fishing communities. First of all, there are the communities of "fisherman-peasants" or "fishermen-farmers" which, according to a complex calendar, both conduct land-based subsistence agriculture and exploit

[2] For the first phase, see eg. Mussolini, G. (1945; 1946), França (1954), Bernardes (1958), Soeiro (1961); for the second phase, Mourão (1971), Forman (1970), Cordell (1974), Kottak (1966), Diegues (1973); and for the third, Maldonaldo (1986), Diegues (1983), Furtado (1987), and Duarte (1978).

seashore resources, usually within estuaries and lagoons. This category of fishermen was extensively studied in earlier papers (Diegues, 1973; 1983) which showed their strict bond to land life, fishing being a complementary activity. They are peasants rather than fishermen, and lack a fishing culture or ideology, as pointed out by Mourão (1971). This does not mean that fishermen from those communities lack a deep knowledge of closed aquatic habitats such as those found in estuaries and lagoons, nor that they do not live almost exclusively from fishing, considering themselves professionals. Many of those fishermen exploit the lagoon, its resources, and also the open sea. In this paper, however, we emphasize a second type of community, which are referred to here as "maritime communities" in which economic, social, and symbolic practices are linked to the open sea, far from the seashore, and which acquire their livelihood from deep-sea resources. Fishing in these habitats is performed by fishermen engaged in traditional fishing as well as those engaged in capitalist enterprises. Maritime sociology and anthropology deal mainly with these communities.

Specificity of Maritime Communities

Making a livelihood principally from the sea, rather than the land, is a basic feature of a "maritime culture" found world-wide in traditional maritime fishing communities. However, this feature alone does not guarantee the existence of a specifically maritime culture.

Geistdoerfer (l988) argues that concepts employed in the study of peasant societies, such as family, wages and ownership, are not adequate to the study of the social structure of maritime communities and the customs of their inhabitants. Maritime communities are characterized by the fact that fishermen live and work in an environment marked by danger, risk, mobility, and physical changes. Maritime communities are to a certain degree historically and culturally shaped by the fact that the open sea, as the place where artisanal fishermen (and more recently, those engaged in capitalist fishing enterprises) spend most of their life.

At the same time, not all "coastal communities" have become true maritime communities. This is especially the case for those combining fishing and agriculture, and those situated in closed environments such as bays, lagoons, and estuaries, which are coastal but not necessarily maritime (Mourão, 1971; Diegues, l983). The unique character of maritime communities is linked to the physical environment of the sea, which suffers marked seasonal changes and is affected by atmospheric phenomena leading to rapid transformations in the marine conditions (thunderstorms, hurricanes, seaquakes), which in turn offer constant danger to those working there. Renewable natural resources in the open sea, especially the several species of fish, are mobile and often not visible, migrating from one environment to another and reproducing themselves according to complex patterns. These environmental phenomena are usually studied by the natural sciences, such as physical and biological oceanography, while social, economic, and symbolic practices arising from the interaction of the sea folk with their environment are studied mainly by maritime socio-anthropology.

Fishermen, in the process of symbolically representing the sea and its resources, developed different kinds of social, economic, and cultural practices for using and coexisting with their maritime environment. These social and cultural practices give a cultural dimension to the maritime environment.

In contrast with agriculture, for example, where natural factors are much better controlled through irrigation and fertilizers, maritime fishing involves much greater non-measurable factors and risks due to specific characteristics of the natural resources, on the one hand, and the fact that the sea is a shared property with free access, on the other. Even if certain social control mechanisms over the maritime territory exist, for instance through hereditary or communitarian title to fishery grounds, fishing remains uncontrollable and highly variable (Maldonado in Diegues & Salles, l988). In addition, in response to social and environmental changes, maritime fishermen have to "reconstruct" their fishery and production zones according to their resources (capital, labor, technologies) and marine conditions, in negotiation with other fishermen and often in direct competition with those pursuing other activities in maritime space, such as offshore drilling and

ocean transport. In these encounters, there is considerable latitude for social relations of conflict, contestation and competition.

The "socialized sea" (often incorrectly labeled a free-access resource) renders maritime communities fixed and dependent on the mobile and unpredictable fishing resources. The inability to predict and control fish stocks puts finite limits on reliance on wage labor and thus capital accumulation, and lends itself to social relations of production characterized by a system of "sharing." Even some capitalist fishing enterprises employ this system of remuneration through portions or "shares". As analyzed elsewhere (Diegues, 1983) the persistence of such atypically capitalistic kinds of remuneration of the labor force is caused not only by characteristics of the natural environment, but in fact are primarily due to the dynamics of the penetration of capitalist relations into the fishing industry, which involves the progressive proletarianization of sea workers and the formal subordination of work to capital. In this regard, Mordrel (1972) and Bidet (1974) make a fundamental argument, considering the "sharing system" an ideological mask which better facilitates the exploitation of the labor force (Diegues, 1983). This system serves to shift the burden of risks from the company to the workers and makes workers and their communities more vulnerable to fluctuations in catches.

Finally, maritime fishermen not only create a self-image (see J. Laberge's study in Diegues & Salles, 1988) based on their relationship with the sea, but also create myths and ritual practices, classify natural resources according to specific categories (Duarte, 1976; G. Silva, 1988), and have their own language (Silva & Brandão, 1988). Unlike communities of fishermen living in sheltered coastal ecosystems (Malinowsky, 1948), maritime societies have developed several practices designed in general to appease the sea spirits. These rituals vary according to whether the object of the dominant symbolic practices is the sea or the fish within it (Geistdoerfer, 1988). There are the rituals of access to the sea and those of returning from the sea, as well as those related to obtaining a successful catch. Due to the fact that maritime resources are variable, uncontrollable and invisible, many maritime communities have developed myths and rituals to protect species' reproduction zones (Bourgoignie, 1972).

Tradition, Change, and Forms of Production in Fishing

The term "social change" may have several meanings. On the one hand this term can suggest "structural changes" or fundamental transformations, which radically modify a mode of production, transforming it into another. This concept is related to the transition of one form of organization of social production to another. It can also refer to social, economic, and cultural modifications that do not involve a transformation of the structural basis of a mode of production. For example, the introduction of new technologies may change certain aspects of production and social life in artisanal fishing communities without affecting the fundamental elements of the petty mode of production. Many such changes are ecological, social, and economic adjustments that do not alter the structural systems of production and domination.

Some changes may originate within a given form of production, as a result of internal causes and factors, while others may originate outside the communities, through articulation with other forms of production, such as introduction of wage labor and changes in the land tenure system. The concept of change is often associated with "development," understood as a set of social and economic "changes" which lead to an increase of production and a more egalitarian distribution of wealth.

Up to this point this paper dealt with the characterization of common features of maritime cultures. However, as mentioned above, the relationship with the sea is not the only element which defines these communities. They spring from a particular historic, social, and economic context in which their relationship with the dominant social formation plays a fundamental role. In the Brazilian case, in-depth research is needed on the origin, production, and reproduction of both maritime artisanal fishermen and those engaged in capitalist fishing enterprises. For example, we must begin to explain the existence of communities such as those of Itaipava (Espírito Santo State) and Galinhos (Rio Grande do Norte State) who live exclusively from the sea, with the fishermen

navigating more than 30 miles away from the coast in small sailing boats, or the raft fishermen in the Northeast of Brazil, who have a long-term historical relationship with the sea. We also need to understand the complex ways in which the petty mode of production (which includes peasant fishermen's production), as well as that of maritime artisanal fishermen, co-exist with capitalist production, which encompasses both ship-owners' fishing production (owners of more than one boat) and corporate fishing production.

The problem of tradition and change only can only be understood in its full complexity when seen in the context of multiple forms of production articulated within a social-historical formation, and especially when this involves a transformation of one form of production into another--for instance petty fishing into capitalist production (Diegues, 1983). Additionally, the issue of tradition must also be analyzed in the light of the transformation of pre-capitalist fishing into capitalist forms of production, which are characterized by a separation between the producer and his means of production, and the introduction of capitalist labor relations.

It is important to remember that one of the fundamental characteristics of pre-capitalistic forms of production is their articulation with the other forms by which they are dominated. It is also important to keep in mind that according to Barel (1973) the petty mode of production is always a subordinate mode articulated with other modes of production. Each one has its own laws for the reproduction of its factors and relations of production. Or, for Barel (1973), each one has a definite reproduction cycle of its elements, which mutually influence each other when articulated. Barel underlines the contradictory existence, at any given moment, of reproduction cycles and of systems of different ages.[3]

Social reproduction on a global scale results from the articulation of different reproduction cycles, corresponding sometimes to the logic of distinct social forms. Thus we come to the central idea of the economic and social formation, which is constituted by modes of production with distinct historical ages (be it in terms of the development of productive forces or of distinct temporalities). Barel (1973), for example, says that the petty mode of production, which has a longer historical duration than the feudal mode of production, co-exist with this and the capitalist mode of production. The petty mode of production, however, was not dominant in any of these articulations. Cultural traditions and customs are closely linked to this long temporal continuity of the petty mode of production.

Tradition is a central part of artisanal fishing: "know-how" and knowledge are the heart of the "profession". A profession is understood as the possession of a set of knowledge and techniques, which permits the perpetuation of fishing as a trade. This control over the art of fishing is learned both with the elders and through experience. With the elders one also learns the symbolic representation of the natural world expressed as the "respect" for the laws that govern the sea and its resources (Ribeiro Neto, 1988). This knowledge is located in the figure of the captain who holds the secrets of the sea and of the traditional techniques for locating schools of fish (Forman, 1970).

> *"Within the familiar, autonomous and simple universe of artisanal fishing, the captain is characterized as absolutely responsible for, and the patron of, the boat's and its crew's destiny, the mediator between the land and the sea world, and guardian of his society's secrets." (Maldonado, 1988: 263)*

The maintenance of this tradition is often expressed as a resistance to the introduction of equipment such as automatic pilot, sonar and radar which could threaten the "monopoly" of the master's (or captain's) knowledge of the sea.

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[3] The problem of "different ages" of modes of production is related to the problem of the "natural time" and "merchant time" studied by Cunha (1988) in her work "Tempo natural e tempo mercantil na pesca artesanal" (Natural time and merchant time in the artisanal fishery): "We search only to highlight the presence of temporal arrangements which, considering present internal features, can join or disjoin, structurally, in a relation of convenience or of domination: natural time and merchant capitalistic time, respectively, in their cyclic and linear expression, are simultaneous and ambivalent arrangements of the rhythm of fishermen's settlement." (p.207)

The problem of the permanence of the petty mode of production in fishing is much more acute when one refers to a social sector of production based on the exploitation of renewable natural resources which are marked by seasonal changes and abundance. Some authors (Gutelman, 1974; Meillassoux, 1960) emphasize that this instability of income results from division of production into shares among "fishing partners" as well as from the low level of accumulation in the fishing communities confined to the limited frame of the petty mode of production. As a result, a certain social homogeneity develops, characterized by the lack of definite social classes (Kottak, 1966). Some factors leading to the social conditions of poverty of maritime communities are limited accumulation, low levels of development of the productive forces, and dependency and subordination of small producers to the centers and social classes linked to the dominant mode of production.

These communities must not be considered as being unchanging or as having no history. Several authors (Forman, 1970; Mourão, 1971; Diegues, 1983) have already shown that various technological changes (nylon nets, motors, etc.) were adopted by artisanal fishermen communities without inducing profound transformation in the relations of production.

In some cases, however, there has been a transformation (partial or complete) of fishermen-peasants into maritime fishermen who are still integrated in the petty mode of production.

In the fishing of sardines with seine-boats owned by industrialists, artisanal fishermen seem to have been incorporated into the crews of capitalist fishing boats within a new form of production (Duarte, 1973; Mello, 1985). We observe that this incorporation is problematic, contradictory and in most times transient, with artisanal fishermen frequently returning to the autonomous family form of production.

Some authors attribute these changes to the development of a market for the fishing products (Mourão, 1971; Bohannam and Dalton, 1968). In specific cases a fish company buys the product (fish) directly from artisanal fishermen, usually through trading posts established by the fish company in artisanal production areas, without necessarily disrupting this mode of production (Diegues, 1983). The two modes of production can be integrated through the subordination of artisanal production to the capitalist mode. This arrangement is often short-lived, as it leads to an increased exploitation of higher-valued species in the market (such as shrimp or piramutaba) and to the disruption of the food chain, deteriorating ecological conditions and ultimately greater poverty of the artisanal fishermen when the fish can no longer return a profit on the capitalist market.

The disruption of artisanal fishing is often caused by the dynamics of the advance of capital from other sectors of capitalist production, such as the encroachment of polluting industries and resulting environmental deterioration, real estate speculation, logging, expansion of tourism, etc. On the other hand, as described previously, changes in the petty mode of production are also caused by the articulation with capitalist fishing companies, which require workers for their boats as well as fish products from small producers. In this last case, the capitalist benefits from not assuming direct responsibility for the social reproduction of small producers and their families.

One fundamental question in the process of change involves the possibility of the artisanal fishermen becoming a boat-owner a non-working owner of several ships. This question was discussed elsewhere (Diegues, 1983), the conclusion being that the opportunities for accumulating sufficient capital to buy larger ships are very limited in the petty mode of production. However, there is a greater potential for this when the artisanal fisherman is also the fish trader, and is thus accumulating capital through the extra profit from the marketing of other fishermen's products.

Within the petty mode of production, it is the fishermen/peasants who are most directly affected by the pressure of capitalist society because of both the environmental deterioration resulting from urban and industrial pollutants and the often violent invasion of their land, along with enclosures of beaches and lagoons. The increasing occupation of beaches and expropriation of their property has lead to an expulsion of small producers to areas far from the coast. Urban and industrial pollution, like that of Cubatão, has considerably diminished fishing resources or has rendered them unsuitable for human consumption due to the presence of heavy metals.

A reduction in fish stocks doesn't result only from pollution, but also from predatory fishing by fishing industries which frequently operate in the same coastal areas where the artisanal fishermen work. There are already countless cases of conflicts between artisanal fishermen and industrial fishing boats, especially in the Northeast of Brazil where the artisanal fishermen's traps (covos) and nets are frequently destroyed. However, the increasing degradation of coastal ecosystem, particularly in estuaries and lagoons, seems to be biggest threat to the social reproduction of the artisanal fishermen.

Tradition and Change in Artisanal Fishing: some Examples

Some examples of studies on tradition and change in the artisanal fishing are here compared to illustrate this problem. In his study "Os pescadores do litoral sul do Estado de São Paulo" ("The fishermen of the Southern coast of São Paulo State"), Mourão (l983) attributes changes in fishing communities to the emergence of a new rationality--that of the capitalist market.

> *"The emergence of the rationality of the market system was accompanied by the formation of social groups (artisanal fishermen with motorized boats who exploit the offshore sea) and both phenomena resulted from changes in fishing marketing - especially in the market price setting - and also from the introduction of new capture techniques, which in turn resulted from this new marketing." (p.07)*

Mourão uses a Weberian approach to contrast the typical behavior of those fishermen-peasants in the 1960s that do not follow the dynamic of the market with the rational behavior of the "professional" artisanal fishermen who primarily exploit the open sea with the help of recently introduced inboard motors.

> *"Commercial fishing slowly replaced agriculture as the main livelihood of the studied group allowing the emergence of what we may call a "fishing ideology" in some groups that for centuries has had its economic basis in agriculture." (p.07)*

It is in this new class - that of the motorized artisanal fishermen - which the author detects certain "identification with the sea, where the gratification from work doesn't increase only through an increase in fishery yields but also through the control of the sea environment and the possession of know-how..." (p.124). In those communities of fishermen-peasants inside the estuary where the transition to the motorized deepsea fishing hasn't happened,

> *"fishing has been declining every year due to a decrease in water salinity; the lack of organizational rules (anomie) became the norm, generating conflicts between individuals and a breakdown of societal consensus." (p. 222)*

Mourão also shows, in a thorough analysis of several communities, the conflicts between the new classes of motorized artisanal fishermen and the local agriculture-based elite (in the case of Cananéia, São Paulo State). The emergence of new classes linked to motorized fishing, of innovative fish merchants who finance the production, and of a new middle class originating outside the city of Cananéia broke down the domination of the traditional elite.

Finally, the author proposes the construction of a fishing pier which would encourage production by artisanal market-oriented fishermen. The author suggests that over time and with the adoption of industrial methods, fishing may lose its importance for the traditional fishermen-peasants, except for those artisanal fishermen oriented to the market.

In the years following the construction of the Cananéia fishing pier the transition to industrial fishing occurred, but the motorized artisanal fishermen have not been incorporated as members of these crews because the industrial fishing boats come from elsewhere to catch shrimp (from Santa Catarina and Santos). Communities linked to the maritime coastal fishing were able to maintain their stability (Sales, l988) in contrast with countless communities linked to the lagoon, which suffered greatly from a decrease in fish stocks, real state speculation, prohibition of

traditional activities (agriculture, palmheart extraction) and establishment of environmental protection areas.

In this case the emergence of a new rationality among the motorized artisanal fishermen was insufficient to induce the transition to capitalist fishing. Essential structural elements for this transformation were lacking, that is, lack of capital accumulation for buying larger boats and better fishery gear, introduction of a real or disguised labor typical of the capitalist fishing industry, and consequently the capitalist ideology appropriate for this form of social production.

Forman, in his book The Raft Fishermen (l970), was also concerned with social changes and tradition in the peasant economy. Studying a raft fishing community in Alagoas (Coqueiral), the author investigates the problems of "tradition" and technological innovation.

in regards to "tradition", Forman says that Coqueiral's raft fishermen are inventive and adopt innovations which directly benefit them without presenting too many risks, including for example the introduction of more efficient nets. For the author, despite the traditional character of the fishing activity, changes happen slowly accompanied by new economic relations, particularly by a distribution of wealth that usually works to the detriment of the poorer fishermen.

These changes result from two kinds of variables: the first group includes variations and adaptations easily accepted by independent producers, and the second one includes of larger-scale changes which result from the elite's imposition of new fishing techniques, aiming at the control of natural resources and the labor force. The technological innovations in the studied case are therefore related to the local power structure. In Coqueiral the local elite manipulate the natural and social environment according to their interests, and in order to control the labor force they increase the tensions present in an incipiently stratified community. They impose behavioral norms and control the fish market. They introduced boats into the community to employ the raft fishermen as cheap labor, thus avoiding the introduction of techniques that would mean more independence for the artisanal fishermen.

According to Forman, raft fishermen have a clear sense of the relation between wealth, production techniques and work. They are aware that despite their hard work they won't be able to accumulate wealth, which ends up in the hands of the local merchants. At the same time the author stresses the factors that lead to a certain social homogeneity, especially the extensive family solidarity and intra-family cooperation. For him, conflicts and the exaggerated competition are avoided by not revealing how to identify the fishing grounds.

Kottak conducted a diachronic analysis of the change processes in the community of Arambepe (State of Bahia) in two studies: the first, The structure of equality in a Brazilian fishing community, was published in l966, and the other, Assault on paradise, in 1982. When he began his study in 1965 the community was relatively isolated, with a high degree of social homogeneity marked by the existence of family solidarity in fishing work and in the whole of social life. Additionally, social stratification had not yet appeared, and the community was self-sufficient in food production.

When the author first returned in 1973 he already noted great transformations caused above all by the establishment of "Tilbrás", a chemical industry illegally sited near the beach, which had begun to pollute the coastal environment. Given the beauty of the beaches and the landscape and also its proximity to Salvador, tourists began to visit the community. Whereas in 1964 fishing families constituted about 74% of the community, by 1973 the proportion had fallen to 53%. Also, there was already a greater differentiation between the owners of ships and nets and fishermen, mainly because, with increased capital and technological intensity of production, access to the means of production was more difficult for crew members. The introduction of motor boats benefited mainly those from outside the fishing sector and a few who were already ship-owners. A cooperative had been created and fishing still represented the most important activity in the area.

Returning to the community in l980, the author observed further changes caused by a new asphalt road which connected Arambepe to Salvador. Tourism had intensified and turned into the most important activity in the community. The number of fishermen had fallen to half the number of 1973, and fishing activity had undergone great transformations with the introduction of a corporate fishing industry which used primarily migrant labor from outside the community. Many

families had begun to live from services, such as house and boat rentals, rendered to tourists. The establishment of a hippie community also contributed to changing habits and customs.

Social relations in fishing which had been marked by cooperation were transformed into exploitation of the labor of those who did not own ships. The fishermen stopped fishing with "joint lines" and started to work with "separate lines", each indicating his property by marking the fish he captured. A social stratification was created and fish merchants, ship-owners, public servants and Tilbrás workers were at the top. The patterns of solidarity changed as well as religious behavior. Arambepe, which had been a paradise of homogeneity, was transformed into an open field of social differentiation, where new patterns of urban behavior brought by the media and tourists became dominant.

Another important contribution to the analysis of changes in artisanal fishermen's communities was presented by Duarte (1973) in his work As redes do suor (The nets of sweat). Duarte studied the ideological mechanisms of the change from artisanal fishing organization based on the artisanal production unit (companha), characterized by cooperation among artisanal canoe fishermen, to the emergence of a new division of labor in the fishing of sardines with large seiners. He analyzes the social reproduction of the canoe fishermen and the impacts suffered by them with the imposition of new relations of production coinciding with the introduction of seiners (traineiras) in the community of Jurujuba (State of Rio de Janeiro). He studies the issue of small-scale fishermen's identity centered on the "companha" model,

> *"found in the past as a reference for common legitimacy. A past in which fishing production occurred only in canoes moved by paddles, using hand-woven cotton nets and employing a labor force according to a regime of equality and family organization in which a great deal of reciprocity was present." (p.5)*

The fishermen's identity was marked by an association of interests, the idea of a community of fishermen, stability, and a common tradition.

The turning point for the change in working conditions and for the absence of "union and solidarity" is linked to the arrival of the seiners, which broke down the "companha" model. Seiners, despite permitting the continuity of certain characteristics of canoe-based sardine fishing, represent the symbol of change because they establish a starting point for what is called "modernity". In this process the absentee ship-owner appears, as well as the role of skipper and other specialized functions (mechanic, cook, etc.).

Although the companha ideology helps to disguise the crew fishermen's exploitation, the "share" distribution of the seiners is seen by crew members as less equitable and inferior to the companha model. The fact that the greatest part belongs to the ship-owner is considered unfair when compared to his contribution to production. The crew-members, on the other hand, consider themselves to be a direct heir to the companha tradition. He feels the change as a kind of pressure. An exterior menace hinders the perfect performance of his practice, rendering him marginal not only to the dynamic sector of the seiner's production but also in relation to the traditional model of canoe production. In this sense the world of disorder introduced by capitalist production, which degrades work and the knowledge of the sea and its cycles, could only be modified by reintroducing the companha model which, however, is not the same one that existed in the past. According to Duarte,

> *"although one may say that these representations of continuity help to disguise the practice of overwork extraction which appears in the new relationships of production at the seiners, they express more than this: the fragility and complexity of the risks that are part of the practice of differentiation and the continuous construction and reconstruction of identities inside the accessible codes of legitimacy." (p. 263)*

The problem of tradition and change in artisanal fishing is very often found in many works which deal with the impact of capitalism and industrialization in an area of recent capitalistic expansion in fishing: the Amazon region. Furtado's (1987), Penner's (1984), Loureiro's (1985), and Mello's (1985) works all show, by means of different analytical and descriptive methods, the same

process of transformation in the traditional fishing economy in several locations (especially the coast of Pará State) induced by industrial fishing, which usually comes from the south of the country. After totally exploiting the fish of high market value, like shrimp, in the southern coast, they move with fleets and processing industries to the north, where large fishing banks are situated. This process of "modernization and pillaging" which had already begun in the 60's was accentuated in the subsequent decades with a violence unprecedented in this country.

Although in the beginning these industries used their own boats for the intensive fishing of commercial species for export (shrimp, piramutaba, etc.), they also started to exploit areas reserved for small-scale fishing. Because of the over-exploitation of fish stocks in these areas, the industries began to directly incorporate artisanal production. Mechanized intensive fishing brings disastrous results even to the fishing companies. That is why large industries don't expand by increasing their fleet but by controlling the market for artisanal fishing products (Mello, 1985: 291). Artisanal fishermen sell their production to freezer trucks, trading posts or fishing terminals established by the government. This kind of marketing not only diminishes the cost of production but also increases the corporation's profit. Production by artisanal fishing is transformed into an external division of the industry (Mello, 1985: p. 265), in a de facto extension of the private property of the industry.

The state is responsible for most of the fishing extension services, construction of piers, and credit services for the small producers. Modernization, with technological innovation in artisanal fishing, is, according to Mello (1985), not a neutral strategy but is part of a strategy of big business reduce their costs. Capitalist industries have serious conflicts with artisanal fishing, resulting from unrestrained pillage of natural resources, which cause a high death rate of small fish due to trawling and also lead to the destruction of traditional fishing equipment.

In fact, the "modernization" strategy promoted by such public organs as SUDEPE fundamentally benefits the large corporate fishing interests and has led to the impoverishment of the regional natural resources as well as of the small producers (Diegues, 1988). Even SUDEPE's 1973 plan of support for artisanal fishermen (PESCART) was based upon technological modernization, the more efficient use of financial resources, the elimination of paternalism, the integration of assistance programs and the integration of artisanal and industrial fishing. The basis of PESCART was "technical assistance" supplied by fishing engineers, most of whom considered "development" to be nothing more than the introduction of new fishing and fish processing technologies.

These technological "innovations" had two main faults: first, they were not always necessary, because the problem wasn't the level of production and productivity but rather the low prices paid to the fishermen through the unfair system of "middlemen"; and second, the proposed equipment was frequently too expensive for small fishermen, and controlled by merchants and business owners. The socio-cultural context and the power relations in the fishing communities were not taken into account.

The objective of this paper was to raise the main problems facing Brazilian researchers in understanding the changes which artisanal fishing and fishermen communities of the Brazilian coast are going through. As mentioned before, the problems of river-based communities and of those who live at the shores of the reservoirs of large Brazilian dams were not addressed, for they inhabit a world of their own, and are highly susceptible to the impacts of mega-projects and public policies.

Understanding the processes of socio-economical change which this much neglected sector is undergoing is not just an academic exercise. In the current political context, it is not enough just to provide subsidies to the fishing industry. Experience shows us that government policy has favored the interests of big businesses bent on export, rather than the improvement of the living conditions of the coastal populations, who have been deliberately marginalized. From our point of view the intellectual and academic effort should support fishermen's social movement in the same way as landless people, Indians, river-based populations and rubber-tappers that started demanding the recognition of their rights as food producers, as workers and most importantly as citizens.

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SPACE AND TERRITORIALITY IN THE WORLD OF ARTISANAL FISHING[1]

Lúcia Helena de Oliveira Cunha[2]

The relevance of the discussion on "Space and territoriality" stems from its wide range of approaches and also the fact that it brings together nodal categories which are important to understand the life of artisanal fishermen. Such categorization includes simultaneously economic, social, political, and cultural aspects of the relationship between fishermen and nature. Space and territoriality are also categories defined in the specific activities of artisanal fisherman inasmuch as they point to his different domains of life - water, land and atmosphere[3] - as fishermen appropriate these spaces (and their resources), imparting meanings to them.

In this regard, artisanal fishing activities (and other activities which directly utilize nature as resource) enable us to think clearly about human-nature relationships in terms of both, with their multiple meanings. In the case of activities directly restricted to an industrial logic, the opposite seems to occur: nature often presents itself as fixed and homogeneous, reduced to an economic enterprise, an inert or static object, stripped of its own laws and meanings.[4]

Thus, to understand the world of an artisanal fisherman implies the recognition of how this social subject interacts with nature in the specific way nature is presented to him - with its peculiar rhythms and movements - and also a recognition of how fishermen appropriates and attribute meaning to nature. It is within this relationship, founded on the specificity of the aquatic space - that fishermen produce their existence, both as a material and imaginary expression.

A specific mode of appropriation and representation of the maritime space, rich in meanings, is created from within the relationship between fisherman and nature. According to Godelier (l982), the way in which a certain space is exploited is linked to "... the system of representations of the environment which the members of a given society create, individually and as a group, for they act upon the environment based on these representations...".

My concern in this debate is precisely to point tot the fact that the sea, beyond a space of survival, is also and simultaneously a site of culture. As Maldonado states (l988:261):

> *... the terms "land" and "sea", which form the fundamental dyad for the arrangement of space in fishing communities, are more than the expression of spatial realities empirically recognizable, or of physical attributes..., they are explanatory and signifying terms heavy with specific and local values ..., which often correspond to certain kinds of division of labor according to sex and age ...*[5]

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[1] The ideas developed here follow, in great part, from the work for my Masters thesis (Cunha, 1987).

[2] Coordinator of the project "Coastal Communities in Guaraquecaba: Different kinds of utilization of space and natural resources. By the Programa de Pesquisas e Conservação de Áreas Úmidas no Brasil. IOUSP\F. Ford\UICN, 1978.

[3] When combining water, land and atmosphere as their domain of life, artisanal fishermen show a three-dimensional notion of space, in contrast with the urban space notion which is homogeneous and horizontalized. One must take into account however, that with fishing being increasingly inserted into merchant production, that notion is liable to disappear - the sky will then be considered above men and dissociated from cultural and productive life. Anyway, although diffuse and fragmentary, the cosmic knowledge acts as a reference in the social world affecting productive activity (see Cunha, Lúcia H. D. In: Entre o mar e a terra - tempo e espaço da pesca em Barra da Lagoa. São Paulo. PUC, 1987).

[4] Diegues proposes a very fertile reflection on the issues briefly presented here, pointing to the dynamics of the relationship between man and nature and particularly to the specificity of the relationships between artisanal fishermen and the maritime ecosystem. Diegues, Antonio Carlos Sant'Ana - Pescadores, camponeses e trabalhadores do mar. São Paulo, Ótica, 1983; Diegues, Antonio Carlos Sant'Ana. Formas de organização da produção pesqueira no Brasil. Encontro de Ciências Sociais e o Mar no Brasil, 2, São Paulo, 1988.Collection of papers presented. São Paulo, Program of Research and Management of Wetlands in Brazil/USP/FORD Foundation/NCIU, 1988. It is through working with his basic formulations that I have developed my own reasoning, whether in grasping the specificity of the "coastal space" or the "natural rhythm" immanent to artisanal fishing.

[5] For more on multiple meanings of the sea and land in the world of artisanal fishermen as well as in the world of external agents which act upon these spaces see Cunha, Lúcia H.O. Entre o mar.., 1987, Chapter 7, p. 185-215.

It should be emphasized here that the sea is not only a mere source of natural resources designed to provide fishermen with a livelihood, because the very appropriation of the instruments of labor does not result, by itself, in the appropriation of products. Along with the objective social and natural conditions, control over the process of work also pass through the subjective domains of the production relating to tools,[6] as well as cultural and physical codes, which allow the appropriation of the aquatic space and its resources.

Fishing knowledge is culturally produced and accumulated through professional practice and continually recreated according to the domain and obligations engendered by the specificity of the maritime environment, which presents itself as cyclic, mobile, and unpredictable. In other words, the appropriation of the sea and its resources requires the knowledge of a code of "know-how", which is constructed and ritualized in the sea by means of tradition, apprenticeship, experience, and intuition. This means that the appropriation of this space is simultaneously a cultural and productive act.

This socially produced "know-how", which is transmitted by the elder and mediated by the individual fisherman's experience, is expressed not only through the operation of fishing equipment, but also by the knowledge of the conditions of its employment - the domain of space.

Although artisanal fishermen often feel threatened by the wider processes that tend to disrupt their way of life, one must take into account that:

> *... more than in any other profession, the decision of setting a net, for instance, depends on the evaluation of a series of factors ... which range from the position of the moon and its influence on tides (atmospheric conditions), to the habits of fish migrating in search of food ....(Diegues, l983: 97-98).*

As other researchers have observed, the identity of artisanal fishermen - as professional fishermen[7] - is bound up in the domain of a cultural code of access to the sea and fish,[8] which implies the knowledge of their secrets and tricks.[9]

It is important to mention here how fishermen imaginatively represent their space - "the sea is nobody's, the sea is everybody's" - which expresses a rather singular concept of territoriality, based on infinity, the immensity of the space (Maldonado, l988), and the absence of ownership. This suggests a concept of freedom, which seems to act upon the appropriation and exploitation of the environment and its resources.[10]

Despite the concept of the undivided maritime space, marked by symbolical elements - real or illusory - this space is not homogeneous, undifferentiated: there are sites, points or areas of fishing, territories, routes, which impose certain movements or routes linked to natural factors, such as tidal rhythm and the cycles of fish, atmospheric conditions, and specific social and cultural factors. In this regard, according to Maldonado (l988: 262):

> *"In order that the sea can enable its physical and social reproduction, fishermen customarily identify fishery grounds in the maritime space to which they have access ... sites of abundance, whose routes are secret, and share information on this division and these fishery grounds ..., according to the movement of fish shoals and of the occasional changes in the ecosystem in which man is a link. The ownership of "these portions of the sea" is cyclic, with the movement of the tides and fish, and sometimes*

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[6] As for this, see Duarte, Luiz Fernando. As redes de suor: a reprodução social da pequena produção de pescados em Jurujuba- RJ (Master thesis presented to the Federal University of Rio de Janeiro), Rio de Janeiro, 1979, p. 60.

[7] "Professional fishermen or commercial fishermen" is the term employed by fishermen from Barra da Lagoa to characterize their identity in contrast with "amateur fisherman", emphasizing the knowledge and the sense of art implied in their profession.

[8] See Duarte, p. 60.

[9] See Diegues, 1983, p. 1194.

[10] I tried to show that, although founded on the "natural" rhythm of fishing, the category freedom in the life of fishermen from Barra presented itself as a counterpart to the "works of land", since the latter are identified with the discipline of industrial work- with chronological time. It is worthwhile to investigate how this concept as well as others suggested by Maldonado (1988), are constitutive of his culture and in the way in which he appropriates the space and lives the time, both modulated by the movements of nature.

this extends to the coast, to the space of residence and to the space of market, establishing patterns of residence and inheritance and influencing other social relationships".

As the site of work and life, the sea is thus a very meaningful space with characteristics particular to the productive and cultural world of artisanal fishing. Hard work and efficacy of techniques not always allow one to overcome nature, for it imposes limits and borders not always defined, due to its inconstancy and unpredictability, as well as to the fact that its movements often do not depend on the productive forces acting upon it. To evoke symbolical mechanisms linked, for example, to chance and to mystical elements, is meaningful in the fishermen's world, whether as a means of overcoming or submitting oneself to natural forces, or as a mechanism of control.

It is necessary to analyze not only how these symbolical concepts are constructed as a consequence of the characteristics of nature - simultaneously a provider and a threat to the conditions of fishermen's reproduction - but also how cultural concepts of appropriation of the space influence the productive process in the sea, as Maldonado suggests. It is interesting here to observe that the close relationship between fishermen and the sea is highlighted in the very way in which the sea is represented. The sea is described in terms of attributes which are not peculiar to it: "water is burning", "water is blinking". Fishermen usually employ categories expressing this close relationship when talking about the species of fish.

... the mullet is touchy... "she" is more sensitive, isn't she ? ... she feels any noise and disappears, she sinks. Another fish does not. If you frighten her, she is back after a while, she is already floating over there...and the anchovy, it beats, doesn't it ? It jumps out of the water, jumps upon the manjuva, not at the same way as mullet does, which sometimes jumps, it is feisty ... (Fisherman Vico - Barra da Lagoa, SC, l986).

The classification of fish is peculiar: they are classified according to attributes and categories related to human life, as well as terrestrial and flying animals; they refer to both external features and personification or naming; they are silly or smart, some are more sensitive than others and, additionally, fish communicate with each other. There are *João-Dia* (John Day), *Maria da Toca* (Hidden Mary), *Solteira* (Spinster), *Namorado* (Boyfriend), *Siri-donzela* (Maiden crab), *Siri-boa* (Good crab), *Cação-cornudo* (Horned dogfish) ..., *Guerra Azul* (Blue war), generally, names and qualifiers which correspond to the human world.[11] As regards the correspondence to the characteristics of terrestrial animals, some species of fish are classified as follows: *Cação-gato* (Cat dogfish), *Esporão* (Spur, because the eye is identical to that of cat), *Peixe-cobra* (Snake-fish), *Peixe-galo* (Roosterfish). "There are flying fish, similar to a small bird; they fly over the water."

Other terms seem to express this relationship between the fisherman and his world of work: "fish turns", "walks", "travels", "sleeps", "is nervous", "is tired", "comes running", "we visit the net everyday", "old wind"; "young sea", "old sea"; "the sea is angry or calm".

In addition to species of fish, stones are designated by qualifiers or names: *Testa de Burro* (Donkey's Front), *Lage do Mathias* (Mathias' Plateau), *Saco da Luzia* (Luzia's Dem), *Pedra da mamica* (Tit Stone), *Frade* (Friar), *Pedra da Miséria* (Misery Stone), *Morcego* (Bat), *Lage do Augusto* (Augusto's Plateau), *Pedra puxa-canoa* (canoe fish stone). This is also true for other elements, which are part and parcel of the domains of fishermen's life: *mini-saia* (mini skirt), a casting net for capturing shrimp, and the boats, which are baptized with specific names. The maritime environment in its different planes is exploited as a domestic space; it presents its activities as elements of the structure of a house -- for example, fishermen define the parts of gill nets (or surround nets) as the pathway, the walls, the floor, and the ceiling.

Such words tell us a lot about the interaction between fisherman and his domain of survival, as a domesticated space which has, simultaneously, its own time, independent of human action: the sea seems to be felt as an living being.

[11] See the extensive analysis performed by Silva on how the sea is classified by fishermen in: "All which the land possesses, so does the ocean - the classification of living beings among fishing workers in Piratininga" (Silva,1988).

"We like the sea, but feel a kind of respect. Every fisherman respects the sea. If not, tomorrow, during a day with such a wind, if he went out to the sea, he would know that he was throwing his life against the sea. The sea is not for playing... because, when it wants to be alone, then it stays alone (Ostemir Coelho, local fisherman, 19 years old, 1985)."

With names, qualifiers, routes, points, collective and individual spaces, stranger and familiar spaces, with differentiated spaces for exploiting resources, with multiple temporal rhythms and distinct territories, the sea is, as seen before, more than a space of survival: articulating economic and cultural dimensions, it is a unique social space, a territory constructed by artisanal fishing for the production and reproduction of its life.

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WATER, LIFE, AND THINKING: A STUDY OF THE WORLD VIEW OF FISHING WORKERS

Gláucia Silva[1]

This paper will to present some thoughts on the opposition between life and death found in the discourse of fishermen from Piratininga, a beach of the city of Niterói, in Rio de Janeiro state. More specifically, I would like to study these categories as they relate to both the social and natural worlds, that is, how they are articulated with the dichotomies of sea & lagoon (referring to the lagoon that exists in Piratininga) and female & male, dichotomies which permeate the entire life of these workers.

Fishermen understand nature as two great worlds: that of the sea and that of the land, the former being considered a very special space deserving of much reflection and admiration. This world built around the sea encompasses also sky, clouds, rain and winds, elements which can constitute the setting for the human sea-goer (*embarcado*). The land has a tame nature; it is predictable and its laws and cycles can be controlled in certain respects. And since society is understood as a dimension of this world, social rules also reinforce this expectation of predictability.

The world of the sea, constantly changing and characterized by its own unique organic pattern and laws, especially those regarding tides and winds, is seen as an expression of nature combining unpredictability and rules, threats to life and abundance. The sea has its constants, its phases known by fishermen, but the variables are such that the experienced captain's wisdom can be confounded by the mystery (*mistério*) which makes fish become suddenly scarce, or by the unexpected gale which threatens survival.

These two poles, according to which nature is divided by the interviewed people, are understood differently in terms of the category of the living. This is apparent in the emphatic characterization of the lagoon as "dead," while connotations denoting a living entity are attributed to the sea. Since the lagoon is a body of water where many creatures from the sea can live, it could be discursively treated as similar to the sea, which would underline its liquid nature in opposition to the continent where it is located. In reality, however, the discourse takes the opposite direction, including the lagoon in the realm of land. The basis for this can be found in two features of the sea which make it a very special and unique entity: it is boundless (*infinito*) and its water is alive.

The conception of the water of the sea as a living thing suggests that for fishermen "living nature" encompasses not only animals and plants which they know, but also phenomena and substances, such as rain and sea-water, which will here be called "entities."

Fishermen from Piratininga are able to cite several attributes (movement, growth, eating, breathing, reproduction, and the presence of blood (for animals) which a living being must have in order to deserve this classification. This living being, however, can have few, many, or all of these qualifications, which reveals that this conception of life has an implicit gradation according to which a blooded being is more living than an other, bloodless living; an animal (moving) is more living than a plant (fixed) and so on.

Entities such as water, both in the sea and in rain, which have voluntary movements and the ability of changing behavior, belong to the living universe in the discourse of fishermen because they have "the living essence" that brings about waves, ebbs and flows, torrents, drizzling rains--in other words, several expressions of the same element. Since these dynamic processes are understood as a sign of a certain "degree of life", one can say that, for the interviewed people, this concept does not base the possibility of the existence of life on an organized substrate that can

[1] Lecturer at the Federal University of Rio de Janeiro.

realize it by means of the assumed functions, but links it to something that is able to impregnate (and move) matter.[2]

It is not therefore just any type of motion that indicates the presence of a life essence, but only those kinds of movement which denote autonomy or will (*vontade*), a concept which expresses the tendency of the these fishermen to extend human rationalism and volition to natural beings. One example of autonomy and capacity for volition of the sea water is what is called "fight of tides" *(briga de maré*), described as water masses that collide because of their different directions, thus carrying the boat and net backwards and forwards.

A previous paper (Silva, 1988) discussed the different meanings proposed by the fishermen's formulations which identified purity and perfection as essential attributes of nature. It was observed that perfection is a natural quality and the initial motivation for the existence of each being. Nature is perfect, as long as all that belongs to it has a specific function, essential to the harmony of the whole. Purity reveals recurrence or permanence of a phenomenon. Therefore, the fact that natural events repeat themselves in such a similar way is accepted by these people as a sign that such phenomena are very close to the principle from which they stemmed; they are in "a pure state," like God made them, unchanging and repeating themselves for ever.

It is in the nature of sea water to change according to some pattern or to be agitated for no apparent reason. Such changes do not prevent fishermen from noticing their recurrence and consequent purity. Water can be darker or clearer according to the current; as one of them states: "tides toward south, water is darker; tides toward east, water is clearer." There are winds that agitate - thus enhancing the effects of waves - and others that render the sea calm. The seasons of the year and the moon's phases also affect tides. This is seen as evidence of the recurrence of the sea's laws, and they do not question the autonomy of the mutability of the sea water, because it conceals the secret of becoming unaccountably too calm or too agitated, despite the factors mentioned above and in addition to other aspects, such as the "fight of tides".

The sea water has a light which shines at sunset and is turned off at sunrise, and which makes it possible to catch fish without lights on the boats. The *ardentia*, as this phenomenon produced by bioluminescent protozoa is called, reinforces the suspicions of the existence of a submersed “other world” (Silva, 1988).

The salt present in water also reinforces its purity, being considered a sacred substance,[3] and is seen as having the capacity to eliminate the pollution to which the sea is occasionally subjected. Because of these components the sea water is able to impose its properties to other kinds of water, such as, for instance, the water from the hills of the continent. They explain that this can be seen from the boats as a separate body of water, in the form of dark areas of the ocean, which are subsequently transformed into sea water. Therefore, they don't believe in the pollution of the sea, because in order to disturb the sea, pollution should be as infinite as the sea and should also resist salt, two unlikely alternatives.

Because it does not undergo significant changes, the water of the lagoon is considered dead. The contrasts between the universe of the lagoon and that of the sea are so great that from the fishermen's point of view associating the boundlessness of the sea to the smallness of the lagoon sounds like a sacrilege. The immensity of the ocean seems to be understood as an element essential to the autonomy shown by sea water. The temperature of lagoon water is determined by the climate, so that the interviewed people claim that the direct relationship between external temperature and that of lagoon water is due to its size. The water of the sea can be cold during the summer and warm during the winter, and this autonomy is reinforced by its immensity. In contrast, the water of the lagoon submits to environmental conditions, being heated by the sun during hot days and in the summer.

In addition to the lack of autonomous mobility, lagoon waters have characteristics such as its dark color, dirtiness, greater weight, and a certain amount of salt, which combined justify the

[2] The association between the ideas of life and motion is emphasized in Aristotelian thought, which also distinguished the kinds of motion.

[3] Within biblical traditions, salt has been associated with Christianity. This is perhaps one of the most profound explanations for this notion on the part of the interviewed people.

status of dead, according to fishermen. With the water being always dark and calm, the unchanged state of the lagoon is understood as an illegitimate condition rather than a sign of purity, because the maintenance of its properties are not related to any autonomous process, but rather to an incapacity to return to its original state after being changed. The lagoon restores itself not because it has recognizable laws that underlie changes, but because it is prone to a morbid state due to its lack of autonomy, and because its existence depends upon human interference, when its entrance is opened to the sea.

The dark color indicates dirtiness which, in turn, points to the impossibility of the production of, pure, healthy forms of life in this environment. The production from the lagoon has little variety and is *reimosa*, or rich in fat, which is often harmful to those who eat it (Peirano, 1975). They are corrupted forms of life which manage to live in midst of decay (*apodrecimento*), and are considered "garbage", as the locals call lagoon plants, especially a kind of macrophyton common in bodies of water undergoing eutrophication.

The weight of water also adds to the impurity of the lagoon, as shown by the fact that the corpse of a dead man in the sea floats on the surface without sinking, something which does not occur in the lagoon. The weight which prevents the body from floating is also an obstacle to the movement of lagoon life. The discourse reveals that movement acts as a filter, or a means of eliminating dirt. As the constant movements of the sea water recycle it and keep it pure, the stagnant water of the lagoon acts to concentrate of dirt and renders the inhabitants less alive. While the purity of the sea water and the maintenance of its qualities, including cleanliness, is preserved by salt and movement, the lagoon cannot prevent its own dirtiness, being calm, brackish, and devoid of salt.

The native conceptions point always to the boundaries between opposite fields in the sense of preventing a union between them. The pure and perfect life should be kept apart from the impure and imperfect life. Pollution and the water from the hills which reaches the ocean both disappear in the same way as salt water disappears a few days after it enters the lagoon through the opening that lets the sea water in. In describing this phenomenon, they emphasize that these two kinds of water do not mix as soon as the sea water enters. After the entry of a large amount of salt water, all the lagoon becomes clean and blue as if it was composed of only one kind of water. After three to four days, the sea water disappears (they state that they don't know how), and the lagoon returns to its dark state.

One can imagine that this whole set of meanings related to death and impurity attributed to the lagoon is due, to some extent, to sedimentation, which blocks the channels that connect the lagoon to the sea. The fishermen, however, unanimously agree that it has always been so, except for the *fedentia*, a foul odor produced by the rotting of beings which overcrowd the lagoon. "Fedentia" is accompanied by *fermentação*[4] and a large release of gases from decaying matter.

One last consideration about water as a substance with qualities that can be associated with life, as understood by fishermen, relates to another liquid with a comparable function of fostering life in animals--blood. Studies on the representation of the body and health (Duarte, 1986 & Ibanez-Novión, 1974) discuss several characteristics that must be present in order to be considered good blood, compatible with the health of the organism.

Good blood must be strong and contain the proper amount of substances which, if in excess, may render it thick (*grosso*) and, if insufficient, will make it watery or thin. It must also be clean and must not contain substances such as alcohol that could spoil it. Finally, it must be hot and red but with no great variations, for dark, light, hot or cold blood indicates deviations from its normal pattern. The "ideal blood" displays a precise degree of density, color, temperature, and a specific composition.

Two of these characteristics are especially important as they clearly bring water and blood together. The first is the term watery (*aguado*), mentioned by the wife of a fisherman who had suffered from anemia. "He got so weak that his blood was just like water (...). The last blood test was already a little better, the blood less watery." The statement shows clearly that blood can be

[4] One must observe that they employ both terms to ferment and to boil for describing this phenomenon, perhaps because the bubbles are similar to those observed in boiling water.

changed into what they said was its raw material, water, when other substances are lacking. The second is that the autonomous movement of the sea confers life to this domain just as blood running through the body maintains life.

Blood, that within the body receives positive connotations, may receive morbid connotations when found stagnant, outside of the body. This is the case of blood shed by a wound or expelled during menstruation, a sign that the body is not producing a new life. In the feminine universe, blood may gain an extra meaning, opposite to the usual sense of non-life. This is the first of a set of ideas implicit in the discourse of the fishermen of Piratininga, and that seems to be linked to the representations of the lagoon: feminine and death.

Although both blood and water are associated with the idea of life, in connection with the representative space of the lagoon and of women, they gain an opposite value - that of dead water and absence of life. Menstrual blood and the coming and going of water through the entrance of the lagoon seem to be understood by fishermen as flows indicating the "cyclical nature" of women and of the lagoon.

On the other hand, menstrual blood is a sign that the organism is capable of reproducing life. Lagoon water is usually dead or stagnant, but when augmented by rain can overflow the channels made by fishermen, showing autonomous movement and taking with it those caught unaware by the current formed. In these occasions it is said that the water *tomou carreira* or *embalou* (ran) meaning to gain momentum or speed, behavior that resembles sea water and shows life.

Both the cycles of the lagoon and of women (menstrual cycle and pregnancy) show duplicity, since fresh water adopts marine characteristics, and women take on the qualities of social being and of a natural organism. Both cycles are connected to the reproduction of life and also have aspects related to death and impurity.

Just as lagoon waters keep to the continent, the fishermen expect their wives and daughters to keep the domestic, private space, leaving the public space to men.[5] The differentiation of access to public and private domains is part and parcel of a wider distinction that pervades all social life -- the separation of the feminine and masculine dimensions. Women must conduct their social life in a way that reveals their dead character in contrast to men, who are "socially alive".

The masculine mobility is great, comparable to that of the sea, and fishermen are allowed to spend weeks at sea and nights merrymaking (*farra*) (Duarte, 1978). They are the strong and lively side of this society, for besides having mobility, they are responsible for sustaining their family, showing the courage required for facing waves and winds on the high seas in searching for fish. Socially speaking, women are considered dead, as their interference in the social fabric is confined to limited, intimate spaces. Also, because they are responsible for giving birth, the women are more identified with natural phenomena. Men are associated with the world of the sea, to a dynamic and unpredictable nature, to the public sphere, and to social reproduction - whereas women are meant for the private realm and biological reproduction. It may be suggested that this differentiation also supports the prohibition of ocean fishing imposed on women, and at the same time their free access to the lagoon.

The lagoon's identification with the continent involves the ambiguity that the lagoon belongs to it, while differing from it along a gradient. There are beings such as adult amphibians and other vertebrate that can spend a lot of time submerged even though they do not breath under water. The habitat of these creatures corresponds to the notion that the worlds existing within the lagoon, and the land, have more similarities than those that possibly exist between the ocean and dry land. It can be said that the sea, the unending boundary between nature and supernatural, is crowded with mysteries but not with duplicity. The lagoon, with its precise boundaries, appears as a condensation of ambiguities. The marine unpredictability may confound those who think they know its laws: the sea, in addition to its external appearance, has an indecipherable and hidden truth. The lagoon possesses an evident and knowable truth, which can therefore be completely unveiled and predicted.

[5] The relationship between the dicothomies of public/private and masculin/feminin are discussed and illustrated by several authors. Among others, I quote Bourdieu (1972) and Pitt-Rivers (1977).

The set of ambiguities attributed to the lagoon (the fact that its recurrence indicates impurity, that its beings possess an unsatisfactory degree of life, that the water contains salt but is not really salty, that it has movement but is not autonomous, and also that it is a body of water that belongs to the dry world) seems to indicate a basic illegitimacy in its existence: it is a frustrated attempt at being the sea. It may be that the ambiguity of the feminine space is equivalent to the latter, in other words, that women are illegitimate social beings, for they have a strongly marked identification with nature.

From this point of view it is possible to understand the statement: "The sea doesn't like women, it becomes agitated when they are present", a common saying among fishermen. This agitation appears to remind them to keep in mind that purity attracts purity, strength attracts strength, life attracts life and that feminine and masculine domains (and that of death and life) should always be kept apart.

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PERCEPTION AND UTILIZATION OF THE SPACE IN ARTISANAL FISHING COMMUNITIES

***Simone Maldonado*[1]**

"Fish is found where the rock is; it is their home... " Captain Guju

This paper presents some considerations about the forms of perception and utilization of space which characterize the maritime culture and orient navigation and the organization of work among artisanal fishermen. Space, a concept fundamental to the operation of the mind (RCO, l979), plays an important role in the organization of human groups and finds expression throughout social life, informing the ordering of the world, and enabling agreements between different human minds, especially concerning territoriality.

To talk about space does not always mean talking about something concrete, a geographical reality of nature which man must face in order to reproduce himself. Maritime fishing is one of the social forms in which specific perception of the physical environment is most relevant, not only for the organization of men in social spaces, but also for the organization of their production, as well as the reproduction of fishing tradition, technically as well as symbolically.

I have examined above all the all-encompassing nature of the concept of space in artisanal fishing, keeping in mind its most universal, representative, and complex expression: maritime territoriality.

The common heritage of the sea is characterized by an inherent indivisibility and a lack of formal and continuous appropriation of the environment. Production is ruled by the conditions in which the biological cycles of the several marine species occur, and also by the immensity of the environment. This is of primary importance when studying maritime spaces: the phenomenon of indivisibility and the lack of formal ownership, along with the mobility of the sea and the unpredictability of production, especially in comparison with land, which has been thought of and historically approached in terms of appropriation and division (Moraes & Costa, 1989).

In addition, these characteristics of maritime space give form to a group of relationships which are specific to fishing communities in their relationship to nature. This movement has been investigated by anthropological studies in other contexts, for instance in Pierre Bourdieu's (l958) book *Sociologie de l'Algéria,* or and Maurice Godelier's (1973 studies on the relationships between Mbuti pygmies and the forest.

In dealing with the relations of humans with the land among Algerian peasants, Bourdieu describes the confrontation between the humans and the environment, which in certain instances are particularly difficult and tense. According to him, in such contexts the precariousness or the difficulties of adaptation to natural space confer certain characteristics to the social order. It is as if man resorted to association with other men, finding in "the luxuriance of human relationships" a counterpart to the vicissitudes of dealing with nature. In the universe studied by Bourdieu, indivisibility (*indivisão*)[2] is fundamental, and essential to the economic and moral equilibrium of peasant communities, in which use, rather than ownership, shapes the relationship with the environment in a society where its customs protect the shared heritage. As in other kinds of articulation with nature, this is made possible through other concepts also of social origin, principles which the community affirms by its very existence with norms and customs which form the foundation of society: solidarity and mutual help. These attitudes tend to be expressed

[1] Lecturer in the Department of Social Sciences of the Federal University of Paraíba.

[2] There isn't a satisfactory substitute for 'indivisão' in English. 'Lack of division' is rather awkward, 'indivision' doesn't exist, 'indivisibility' appears to be the best but unlike the Portuguese word implies inevitability, which is not entirely inappropriate in the context of this paper (Translators note).

recurrently in nonmodern societies, though in different ways, and frequently in terms of exchange, which is considered the underlying principle governing all social relationships. Bourdieu believes that in Algeria the unreliability (of techniques and the aridity of the natural environment contribute to the indivisibility of the territory which not only facilitates human subsistence and adaptation to that environment, but is also promoted by them through rather complex relationships of blood, honor, and production. These relationships mediate between man and nature, as is the tendency in preindustrial and noncapitalistic societies.

The relationship between fishermen and the space is also undoubtedly characterized by the indivisibility, a characteristic of the world of fishermen. There is, however, a fundamental difference between the indivisibility of the land and that of the sea: the indivisibility of the land, when it exists, is established by man's will or design, by an interest of the society which created this indivisibility through a conscious action, as the most appropriate mechanism for dealing with the land for the very reproduction of life. In contrast, the sea itself is inherently indivisible, and the attempts made by human society to create continuous forms of ownership and use of the maritime environment are rare and short-lived. In this case the indivisibility is not due to the lack of usefulness nor to the lack of juridical instruments. The divisions mentally created by fishermen appear to result from specific and predominantly symbolical expressions, kinds of perception, and appropriation of the sea which in turn carries with them other concepts and behaviors, without which fishing production and the reproduction of artisanal fishermen would not be viable.

The description of the wide range of specific phenomena generated by the conditions of common heritage is beyond the scope of this paper, in which I intend to discuss other features of maritime spatiality. A deeper analysis of the space to which fishermen have access reveals a set of other social features, also specific to fishing activity, such as division of work, tradition, family, territory, modernization, and change.

The resources exploited by fishermen are mobile. To establish, maintain and protect boundaries and territories is a difficult task which does not have an equivalent in land-based social systems. For the purpose of production, however, fishermen divide the maritime space into fisheries, fishing grounds, net casting grounds, regions rich in resources - and maintain secrecy about their location and routes of access. As an inhabitant of Ponta de Mato, in the State of Paraíba, says:

> *"This (pointing at the sea with his arm) is many seas. Only one, it couldn't be... And the seas have their "grounds"(pedras) and each one is only one. There is the sea of Miriri, the sea of Cardoso do Norte, and so on..."*

The most relevant characteristic of this cyclical and traditional division which is applied to the sea and utilized by groups of fishermen in the search of fish is that there is no fixed pattern (not even seasonal) for the maritime phenomena and marine species. Thus, the assessment and the productive organization of fishermen concerning space, are related to some permanent sites and to others which are relocated so that the "fishing grounds" are always being rediscovered, lost and forgotten.

The ability to identify the productive zones of the sea and to find one's bearings in the midst of the immensity of the sea, out of sight of land, are part of what has been called "the cognitive skills of fishermen" (Gell, l985; Frake, 1985; Gladwin, l970). They seem to be, however, the result of social and cultural learning in these communities. In this light it seems appropriate to consider the seamanship and territoriality in these groups in terms of practical domain and practical space, concepts studied by Bourdieu (l979). They are specific skills arising from the familiarity of humans with a given space, which are intrinsically linked to activities, perceptions, and attitudes acquired by socialization, as well as by the relationship with the environment, and which account for customs and the capability to orient oneself and to exploit the environment. Thus, seamanship and the art of fishing are socially mediated. appear and evolve in a practical space -- maritime space -- the place where other concepts appear to shape the worldview and the organization of productive for artisanal fishermen.

This knowledge makes possible the seasonal division of the sea into zones for the purpose of organizing work periods, as well as for the purpose of territoriality, which allows the boats to

carry on productive fishing without spoiling someone else's catch. However, this does not render the sea and the sea-based production a free space or one without conflicts**.** The productive territoriality, the fisheries and the space occupied by each boat are social ideals and basic elements for agreements and for the notions of honor and seamanship, which are added to other elements that compose fishing. The rule, however, is not always followed, as the following interview shows:

> *"We sometimes cast a sea-mark in the fishery because nobody can prevent another fisherman from fishing wherever he wants. However, if one discovers the fishing ground, it is the boat's."*

> *"The worst is the robbery of fish-traps and long lines. There are some people who exploit the fishing ground, making no efforts to find it out. Moreover, they take away the sea-mark which is used to mark the place."*

It must be noted that there are some fishermen who admit the existence of robbery, but not its efficacy, as reported by a fisherman from Camalaú, in the state of Paraíba:

> *"Well, to follow another fisherman's boat may prove to be silly. I'm in my boat, you are in your boat following mine. Then, we arrive at the fishing ground, I cast the anchor, you cast the anchor, but you neither catch the fish, nor find the fishery. All this is right here in the fisherman's mind."*

He pointed to his head with his finger, while talking, to indicate "the place" where the knowledge of the sea and the route of fishing grounds are stored.

The isolation of the boat's crew in the productive process is another dimension of the maritime culture permeated by tension and struggles. If on the one hand this aspect of dealing with the apparently unlimited space of the sea suggests equality and cooperation, on the other hand it imposes tense and specific relationships upon the boat's crew, even though blood relationships predominate almost universally among the boat's crew. There are countless studies, papers, and ethnographic investigations, in which the authors record how this contingency is dealt with (Johnson, l980; Thompson, l985; Maldonado, l986; Lerandi, <undated>) by means of societal mechanisms developed according to the rhythm and duration of a fishing day's work, on the way to fisheries. The recurrence of social rites, in which is built a symbolical space setting boundaries between the world of the sea and the world of the land, must be emphasized. One example of this is the "chowders" (caldeiradas) of Algarve, big meals of fish and wine that fishermen take when they return to land. In these events, they try to work out the problems and conflicts that came about during the fishing, which has its end with the chowder. In other groups, each boat displays its fish for the evaluation of land-based society. The people are used to stop, to comment on, and to evaluate the quality and the quantity of fish, which is followed by the weighing and selling of the product, generally performed by women, while fishermen go away from the shore reintegrating themselves to the space of the land. There are also ritual behaviors concerning the setting out to sea (Smith, l977), such as the journey performed by youngsters already initiated in the art of fishing in the company of older fishermen when they set out to sea for the first time. This African rite aims at symbolically giving the youngsters access to the productive universe and the secret of their society rather than at "teaching" the untried fishermen how and where to fish (they must already have learned this during their socialization process).

The constantly changing nature of the conditions of production in the maritime space and the biological cycle of fish account for the seasonality and intermittence of the usual forms of division and use of the sea, not being neglected by fishing groups when the crew is stable (Kottak, l966; Barth, l980; Breton, l98l). The recruitment and forming of working groups are under specific rules of maritime production expressed in different ways depending on the fishery community considered. All of them, though, aim at the stability necessary to good performance. The combination of space management and cooperative efforts of bowmen is essential to fishing activity, a kind of response of fishermen towards the changing nature of the sea territory as well as to the risk and unpredictability considered inherent to fishing (Thompson, l985; Acheson, l980).

These two characteristics do not seem to be related to the issue of space. As characteristics of production, however, they reflect the specificities of the sea and of marine species, of the space

and the product relevant to fishermen. For these reasons, it seems appropriate to consider the mechanisms developed in fishing communities as a response to the misfortunes of the life in the sea and to the relationships with the family and the market. Such mechanisms aim at minimizing or avoiding the risks and difficulties which man faces in his attempt to dominate the sea.

The studies which recognize the existence of the maritime culture (Smith, l977; Acheson, l980; Poggie Jr., l980; Diegues, l983) report that fishing is a highly risky and unpredictable productive activity, which influences the fishermen's way of life and its characteristics. Life and instruments of labor are exposed to a great risk, second only by that of mining. These studies reveal more than an observation of risk and the cyclic and mobile nature of the production; they establish a link between these and the basic and recurrent structure of the fishermen's identity. This maritime quality, established in great measure in terms of the productive spaces, has been considered a fishermen's specific way of life, as well as the fundamental concept which explains how they perceive the maritime environment, "the presage of final ruin" (Acheson,l980). This is described exactly in terms of the awareness of the inherent risks threatening fishermen at sea work. A miscalculation, a wrong step may mean the complete loss of the boat, the devices, and the lives of men.

The subjects investigated in Social-Sciences researches include the human reaction to such circumstances, conditions implying doubts, uncertainties, dangers, and risks, specially those related to ritual practices and social mechanisms aiming at minimizing the difficulties (Johnson, l980; Taussig, l982). Malinowski (l948) observed that in the Trobriand isles, for instance, there are rites associated to fishing in open sea, richer in tension and more dangerous than estuarine fishing, which have also been observed in other cultural contexts and in more recent studies. The description of these ritual behaviors not being the aim of this paper, it seems more appropriate to keep on examining the articulation between risks, the unpredictability in fishing, and the concept of management of space.

Fishermen, in establishing their productive capabilities in the sea, and their agreements and pacts on land, can be considered as living in permanent risk regarding their physical integrity, especially when fishing at open sea. As for the unpredictability of production, it seems important not to associate it with chance for several reasons.

The thoughts presented here on the spatial conditions of production of artisanal fishermen, as well as its unpredictability, considered by some as a matter of chance, set-backs or additional obstacles, are in fact challenges of the natural space in which artisanal fishing occurs. The human reaction towards these obstacles to the production is expressed in terms of the maritime traditions concerning being and doing in fishing communities. The ways of life of fishing groups, their nautical knowledge, their management of the space and the relationships with the land, the mechanisms and social practices, are elements which compose what has been called the maritime culture, and render the reproduction of artisanal fishing possible. In this context, competence is recurrent and takes part in the fishermen's awareness and perception of themselves and of their work at sea. Fishing may seem to them risky and unpredictable, but less than it seems to us, who develop our activities in "terra firma" and with fixed resources. To consider fishing production and the control of the maritime space as ruled by chance would be to neglect the capability of calculation and of organization which orient fishermen's work.

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TRADITIONAL SEA TENURE AND COASTAL FISHERIES RESOURCES MANAGEMENT IN BRAZIL

Antonio Carlos S. Diegues[1]

Introduction

In many places in the ocean, estuaries and bays, artisanal fishermen of the Brazilian coast have marked areas of the sea that "belong" to them as long as they occupy them for fishing activities. In their territories they build their large bamboo traps (*cercos*), *caiçaras* (brush parks) and *viveiros* extensive (aquaculture ponds). Far from the coast, the fishermen are able to discover and return to highly productive rocky bottoms, through a complex system of navigation without compass, locally called *caminho e cabeço* (path and rocky bottom). Some of these rocky habitats are very rich in fish and are kept in secrecy by their "owners". These "territories" have no visible marks or borders but are respected by the other fishermen. The *respeito* (respect) is the basis of this sea tenure. They work well as long as the traditional social structure functions. Nowadays, the disruption of the community life of artisanal fishermen often leads them to abandon the system. In many cases however, traditional sea tenure is still operational and plays an important role in the conservation of fish resources and in the livelihood of fishermen.

This system is based on a long tradition and knowledge of the sea (currents, winds, etc.) and of the feeding, migration, spawning of fish and other aquatic species. This knowledge is not evenly distributed among artisanal fishermen but is concentrated in the hands of the *mestres* (boat captains or skippers).

In the case of Brazil, traditional sea tenure and fisheries management are only now receiving some attention from scholars, scientists and fisheries managers. One reason for this lack of interest is that vast areas of the Brazil such as Amazonia and the sea were treated by powerful industrial and urban elites as "empty spaces". The traditional population of Amazonia, particularly the Indians and the riverine populations were "invisible" until recently. This "invisibility" served the ideological purpose of the elites of occupying Amazonia, as only "uncivilized people" were living there. The same biased view was applied to artisanal fishermen and their communities. When these populations started to react to outsider intrusion, often by force and near-wars, they became "visible", as well as their rich culture and knowledge of ecosystems and management techniques.

As in other parts of the world, in Brazil sea waters are considered "common property" and the access to them and their living resources is free. During the establishment of the fisheries legislation, particularly in the 1960s, "common property" and "free access" became the basic assumptions for the building up of a "modern fishing industry" based on industrial and entrepreneurial activities (Diegues, 1983). The highly subsidized trawler fleet invaded areas traditionally used by artisanal fishermen, disrupting the existing sea tenure. Conflicts became serious in some parts of the coast, particularly in the Northeast lobster fishery. Fishery managers simply ignored the traditional fishing tenure as it was largely invisible to outsiders, and superimposed formal regulations that only favored the newly created and inefficient fishing industry.

Some Historical Features of the Traditional Sea Tenure Systems in Brazil

As mentioned before, traditional management is imbedded in the culture of artisanal fishermen in Brazil. Before the arrival of the Portuguese, most Indian communities fished in rivers

[1] Coordinator of the Program of Research and Conservation of Wetlands in Brazil University of São Paulo.

and lakes and few of them had a maritime culture. Even today, some Indian tribes such as the Desana in the Amazon have a complex calendar of fishing related to the position of stars and to the lunar cycle (Ribeiro, 1992). Archaeological research shows that since 2260 BC a few tribes such as the Tupis fished seasonally in the lagoons of São Paulo and Rio de Janeiro (Diegues, 1983, Costa, 1992). The famous *jangada* (raft) was used by the Indians in the Northeast by the time the Portuguese arrived. During the colonization period several fishing techniques were imported by the Portuguese. They also improved existing ones, as when they added sails to the *jangada* (Selling Jr., 1976). African slaves were also used in whale fishing during the 17th century (Silva, 1991). Most of the Portuguese fishing tradition came not only in the first decades of the colonization but after Independence as well. Most of the fishing tradition in southern Brazil was initiated by Portuguese migrants from the Azores by the middle of the 19th Century.

Two types of relations with the sea were developed. In the provinces of São Paulo and Rio de Janeiro, small farmer-fishermen combine fishing with agricultural activities (Mourão, 1971; Diegues, 1988). In the Northeast, coastal communities have developed a long tradition of coastal fishing, separated from agriculture (Silva, 1992). One explanation for this difference, in addition to cultural factors, relies on the fact that the continental shelf is narrower in the Northeast than in the South and that most of the fish species live in rocky habitats further from the coast, requiring a better navigational and fishing knowledge from the fishermen. The sandy coast of that area also inhibited intensive agricultural activities. In this connection one could conclude that artisanal fishermen in the Northeast have a strong tradition in dealing with the open sea. Recent studies have analyzed the question of tradition within the framework of the field of maritime anthropology (Diegues, 1989; Maldonado, 1992). Most of the fishing was done within the system of the petty mode of production, where part of the fish caught was used for subsistence and part as commodity.

Legislation regarding coastal land has contributed to (but also interfered negatively with) the development of traditional sea tenure. Since the middle of last century a stretch of 33 meters of land measured from the 1833 highest tide belongs to the state (called Terras de Marinha). This area cannot be privately owned and no permanent construction can be made in that area without State permission. Small-scale fishermen, although having no legal title, occupy these areas. In this sense, they have customary rights of occupancy (*posse*) to live in those areas, where they build their thatched roof houses. The same right (*posse*) is transferred to the nearby coastal waters when they occupy a place in the estuaries and lagoons to build their fixed traps (*cercos*).

The State, through the Navy, also tried to control the artisanal fishermen through forced service. As a result, some fishermen's rebellions occurred in 1903 in Rio de Janeiro and Ceará (Silva, 1992). To control these rebellions the Brazilian Navy created, in 1991, the first fishermen guilds (Diegues and Silva, 1992). According to the guild regulations all fishermen should be registered in order to get permission to fish. In practice, each coastal municipality has its own guild that regulates the lives of fishermen. According to the new 1988 Constitution, however, fishermen can organize their own free associations.

Statistic data show (Diegues, 1983) that until the 1960's most of the fishing was undertaken in an artisanal way. In spite of the importance of the contribution of artisanal fisheries (over 70% nation-wide), SUDEPE (Superintendent for Fisheries Development, now part by IBAMA, the National Environmental Agency) decided to create a large program of "fisheries development" based on highly capitalized industries. These industries have received huge subsidies and the artisanal fishermen were simply forgotten. For the SUDEPE bureaucrats artisanal fisheries did not exist as an economic activity and traditional management was ignored by them.

The most important reason traditional management was ignored lays in the fact that artisanal fishermen are socially invisible and marginal (Maldonado, 1992). Cordell (1983) argues that artisanal fishermen are marginal, isolated and powerless.

> *"Marginality of the sort that plagues traditional small-boat fishing peoples in Brazil has its sources in more than spatial and cultural isolation, comparatively low earnings from less capital intensive fisheries, and competing interests. It also stems from a whole complex of prejudiced perceptions and classifications related to the nature of the fishery as a resource, inshore seas, tropics and perhaps the sea itself as contrasted with the land." (p.11)*

Cordell also develops the idea of "taxonomic barrier" as one reason for the invisibility of artisanal fisheries. Although fish is at the heart of some of Brazil's internationally acclaimed regional cuisines and is vital to tourism, artisanal fish production and the fishermen themselves are not acknowledged by the state bureaucracy.

The same view of "marginality" still exists within the State bureaucracy and among many conservationists when proposing the creation of national parks and other types of ecological reserves in wild coastal areas such as mangroves, coral reefs, sand barriers and oceanic islands. Most of these habitats have been traditionally used by artisanal fishermen, where they have developed sophisticated traditional management. In most cases, it can be said that these areas were ecologically protected not in spite of artisanal fishermen but because of their traditional way of life. Yet in practice, the first step to establish a "national park" is to expel traditional fishermen from their subsistence territory and ancestral land. Estuaries, lagoons and islands are viewed as empty spaces but in fact they are marked by several types of "sea marks" and management structures set up a long time ago by artisanal fishermen. Some recent studies, however (Cunha, 1989, 1992; Diegues, 1992, 1989), have shown that ill-conceived conservation, like uncontrolled "development", can be a pathway to increasing marginalization of local coastal populations.

Sea Tenure and Traditional Management Schemes on the Brazilian Coast

Traditional management by artisanal fisheries is closely linked to coastal (lagoons, estuaries, mangrove, etc.) and sea tenures. Sea tenure regulates the access of fishermen to coastal/sea spaces. Traditional management is a set of customary regulations that regulates fishing itself, i.e. the amount and type of fish to be caught, with the goal of maintaining the reproduction of natural resources and the fishermen's communities. It is based on a deep knowledge of the physical and biological characteristics of habitats and living resources. There are no written laws but orally transmitted regulations passed from generation to generation. Very often they are loaded with myths and social symbols. The transgression of these regulations is met with social disapproval and loss of respect.

Examples of sea Tenure and Traditional Management:

Caiçara

This is a brush-park built with mangrove poles making a circle or a rectangle. Inside it the artisanal fishermen lay branches. It is similar to the *akadjás* described in Dahomey by Bourgoignie (1972) and more recently by Kapestky (1981). The similarity between the Brazilian *caiçara* and the African *akadjá*s was first mentioned by Diegues (1983, 1988).

It is not yet known whether this technique was brought from West Africa by the African slaves or developed locally. *Caiçaras* are mainly used by the fishermen of Mundaú-Manguaba lagoons in the state of Alagoas. They are settled in shallow places with weak water currents. Fishermen have a profound knowledge of the fish species that are caught in the brush-parks. Marques (1991) has recently studied the *caiçaras* from an ethnoictiologic point of view. He mentions that the fishermen distinguish fish which live in the caiçara more or less permanently such as the *mero (Epinephelus), carapeba (Eugerres brasilianus), camurim (Centropomus* spp), *caranha (Lutjanus cyanopterus)* and from those which temporary seek protection in the brush-parks such as the *salema (Archosargus* sp) and *vermelha* (*Lutjanus spp).*

The fishermen have also a good perception of the *caiçara* as an artificial habitat created by them. The ecological succession is also noticed: first comes the macroalgae (*cabelo*), then the perifiton (*limo*), the Terrinidae (*buzame*), *Mytella charruana* (*sururu*) and *the Crassostrea rizophorae* (*ostras*). Each stage is associated with a specific fauna. When the climax is obtained the fishermen start fishing in the *caiçara* with nets.

Summarizing, the "caiçaras" are:

a) *a system of sea tenure*: Local fishermen consider the *caiçaras* as their *posse* and territory. Access to the newly created habitat and its resources is determined by the law of respect (*lei do respeito*). As the fishermen say: "We cannot forbid other fishermen to fish in the caiçaras, but they respect our place as we respect theirs".

b) *a unit of resources*: the fishermen have an idea that the *caiçara* concentrates biomass.

c) *a fish aggregating device*: fish species find a new habitat and a feeding place in the *caiçara*. Local fishermen say that "fish go to the *caiçara* to get protection" (Marques, 1991).

d) *a fisheries management technique*: local fishermen utilize these new habitats in a responsible way, using appropriate nets that catch only adult fish. In a broad sense the *caiçara* can be also considered an extensive aquaculture technique, as was noted by Kapetsky (1981).

The brush-parks of Alagoas State, however, are now suffering from the overall degradation of the Mundaú-Manguaba lagoons. Tons of wastes from sugar-cane alcohol production are being discharged into the lagoons. The urbanization of the state capital, Maceio, is also responsible for the overall degradation of the estuarine area and contributes to the disruption of the fishing communities. As local fishermen say: "Outsiders who are not local fishermen lack respect and take fish from our *caiçaras* in the night."

The calão Fishing of Southern Bahia

This type of fishing was thoroughly described by Cordell (1983). It is a type of shallow-water purse-seining in which an eight-man crew works in six- to ten-meter canoes. Purse seining is well adapted to the intricate tidal changes along Bahia's estuaries and creeks that wind back into the mangrove swamps.

> *"lunar/tidal reckoning coordinates all fishing activity. It enables those most adept at net-casting - the skipper or canoe captain - to monitor closely the behavior, migratory routes and life cycles of fish. Because the fish movement is predictable, they concentrate in certain areas depending on the tide, weather, and other natural cycles. Seining operations are very specialized in terms of suitable environment" (Cordell, 1983)*

Cordell (1983) also explains that the skippers (*mestres*) have consolidated control over premium waterspace, which has distinctive spatial limitations within the lunar/tidal cycle, providing territorial foundation for the marine tenure system. Names are given by the skippers who exercise exclusive rights and priorities over these tiny tidal fishing spaces. He has also observed that the skippers give names to the traditional casting spots (called *pesqueiros*) that are microenvironmental areas for fishing. They are subdivided for a particular fishing technique into *lanços* (casting sites) or minimal waterspace as determined by fort-nightly current changes, daily tide-level changes, light conditions during different phases of the moon, bottom conditions, etc.

Cordell (1983) also mentions that fishing rights and property exist as spatial points in the context of the lunar calendar.

> *"Seining and nearly all canoe fishing move in a circuit of areas bound cyclically by the tide, which has a variable impact along the course of the estuary and mangrove channels. 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." (p.27)*

How is access to these spots restricted or permitted to other fishermen? First of all, this tenure system is supported by cooperative ethics rooted in the notion of respect, a code of personal conduct requiring honor and deference. Respect (*respeito*) is a cognitive reference point linked to the community's collective conscience. It influences how fishermen evaluate each other's actions both on and off the fishing grounds. The reputations of fishermen rise and fall in terms of respect. As Cordell (1983) mentions:

"The epitome of this ethical code in fishing is the recognition and respect of traditional territorial-use rights. One captain deferring to another in a situation of potential conflict over a fishing claim upholds respect and sets up a debt of gratitude to be paid at a later date. Failure to honor this type of reciprocity and related personal commitments can be much more devastating for a fisherman than breaking a law." (p.29)

Access to others can also be granted by the skipper in the context of godparenthood (*compadrio*), networks, rituals and obligations. When an outsider fisherman wants to fish in the estuary he usually takes along a crew member who has a local godfather (compadre) or friend. It is a precaution to ensure that his crew will receive good treatment if they have to go ashore and thus avoiding the threat of competition during net-casting operations.

As it happens with the Mundau-Manguaba lagoons, the estuaries of southern Bahia are suffering from outside interference, mainly incursion of industrial fishing boats that do not have the respect and started "pirating" in the customary territory of traditional fishermen.

The Caminho e Assento Fishing of the Northeast

Caminho e assento is a fishing system in which the fishing ground is discovered and pinpointed in the ocean through a complex method of mentally constructed reference points. The fishermen use no compass but still through crossing imaginary lines (*caminho*), taking for reference geographical landmarks such as the top of mountains in the continent, they are able to locate small fishing grounds made of rocky bottoms (cabeços) several miles away from the continent. These fishing grounds are "owned" by the boat captain or skipper who discovered them. Other fishermen do not know where these grounds are located. Some boats might follow the lucky owner of the fishing ground but when the skipper becomes aware of this, he changes the route. After some years, some of these productive fishing grounds might be made public but keep the name of the skipper who discovered them. The secrecy of the cabeços is transferred from the father to his children.

This system was first described by Galvão (1968) in the state of Rio Grande do Norte. Later on, Forman (1970) analyzed the system in the state of Alagoas. According to Forman, the secrecy is the core of that type of fishing and it is a way of diminishing competition for scarce resources. The *segredo* (secrecy), based on traditional knowledge, is a sign of authority of skippers over the other fishermen. The more *cabeças* he discovers and keeps secret, the more fish he lands and the more respect he gets within his community. As a fishermen from Galinhos (Rio Grande do Norte) points out: "The sea has plenty of marks that nobody sees". The "caminho e cabeço demonstrates territoriality and functions also as a means of controlling the availability of scarce sea resources in the Northeast.

The "Viveiros" (Aquaculture Ponds) in the Estuaries

One method to increase fish productivity in the Northeast is the construction of *viveiros* in the inner parts of the estuaries. As mentioned before, estuarine water bodies belong to the State, but in some cases are appropriated by local fishermen through the "viveiros". They are built by closing of part of the estuary through a barrier of wood and clay. Only one gate is left open during the raising tide, through which salty water enters into the enclosed area, also bringing along small fish and shrimps. The *viveiro* is owned by those who build it. The number of *viveiros* has decreased in the region because of the expansion of sugar cane plantations and the increasing pollution produced by the dumping of alcohol production waste, as well as because of urban expansion. The *viveiros* are also a type of extensive aquaculture.

Cercos and Currais (Large Fishing Trap)

These are fixed traps built in many estuaries and lagoons all along the Brazilian coast. They were first built by the Indians to catch migratory species such as mullet. They are made of local material such as bamboo poles. They have one entrance that allows only big fish to get in, as the small ones escape through the fence. The owner of the *cerco* rebuilds it every two years when the bamboo poles decay, and when it is abandoned, another fisherman can build his own *cerco*. No other fisherman will dare to take fish from somebody else's trap as long as the law Of respect prevails. At present, however many intruders, mainly recreational fishermen, fish in the *cercos*.

Restricted Access to Fishing Grounds

According to Brazilian law, fishing is open to all fishermen registered in fishermen's guilds (*Colonias*). However, in some places, local communities have reserved specific areas for the use of their fishermen. That is the case for example, of the Restinga of Pobeba, in Sepetiba bay near Rio de Janeiro, where traditional fishermen expelled large trawlers that came from outside to fish in their area. Artisanal fishermen used only small nets to catch shrimp and felt that their fishery was being damaged by industrial boats from companies. Today the area is used only by the traditional community as the trawler owners are afraid of entering into the restricted area and being attacked by the canoes (Costa, 1992).

A similar situation is described by Hartman (1992) concerning the subsistence fishermen in the Amazonian Lago Grande de Monte Alegre. In the late 1960s, traditional subsistence fishermen who fished in that lake in a communal way started facing the competition of the outside commercial fishermen who used large gill-nets that blocked the entrance to the lake. Fish productivity declined rapidly and threatened the survival of the local fishermen and the control over their commons. In 1966, after demanding the prohibition of the predatory fishing, over 100 fishermen destroyed the gill-nets and two commercial fishing boats. Since then the conflict became permanent and in 1980 the Fisheries Management Authority intervened, reserving the northern part of the lake for local fishermen (Hartman, 1992).

Organized and Sequential Net Casting

Artisanal fishermen are often accused of being disorganized, anarchic and not receptive to management. The opposite is most often the truth as in many cases they get organized by themselves. That is the case in the fishery of manjuba (Anchaviella hubsi) along São Paulo coast. Due to the construction of a barrier in the Ribeira River, the migratory movement of that species changed. As a result, fishing concentrated at the mouth of the river. Hundreds of canoes are now massed during the short fishing season in a narrow area. In order to avoid confusion, fishermen organized a system in which after each net casting the canoe returns to the end of the queue.

Disputes are solved by the fishermen, and their organization is probably better than any other proposed by the fishery management authorities (Lima, 1979).

Threats to Traditional Management

Artisanal fisheries face today strong competition from the so-called modern fisheries and from the destructive exploitation of the coast. Local fisheries are being flooded with large industrial boats using inappropriate gear. Social, spatial and technological competition is taking place between locals and outsiders. Since 1967, industrial fishing has been established using tax incentives and suspension of import tariffs on fishery technology. These incentives have benefited mainly industrial groups. The result of this "fishery modernization" has been widespread destruction of fish habitats, over fishing and marginalization of artisanal fishermen (Diegues, 1983, 1992).

At the same time, from the 1960's onward, uncontrolled use of land and sea resources reached a critical intensity. Large chemical and petrochemical plants, nuclear power stations, dredging of harbors, oil exploitation, coastal mining and tourism have threatened extensive areas along the Brazilian coast. Urban expansion and tourism have targeted biologically rich habitats such as mangroves, sand barriers and islands. One of the most affected ecosystems are the mangroves, from which an estimated two thirds of the fish caught in Brazil feed or breed during their life cycles.

In addition to these impacts on artisanal fisheries, there has been a dramatic increase in the demand for fish in the growing urban centers. Fishing has become increasingly selective and some valuable fish species such as shrimp and lobsters were more intensively exploited. Most of the industrial fishing crews, when profitability decreased, started exploiting fish resources with no respect to existing traditional regulations. In some cases, artisanal fishermen started using the same forbidden fishing gear in order to survive.

In many cases, traditional management techniques have been abandoned as a result of the impact of the activities described earlier as well as because of an increasing disruption of the fishing communities.

Traditional sea tenure is also threatened everywhere, not only by the so-called modern activities but also by ill-conceived environmental and aquaculture plans that in principle should benefit artisanal fishermen. Government institutions are encouraging aquaculture but very often traditional extensive aquaculture systems already used by artisanal fishermen are not considered. As a result, in some cases capital owners and outsiders are the only ones who benefit from these initiatives. The government also promoted the cultivation of species already managed by artisanal fishermen. The adoption of these techniques does not necessarily lead to an improvement in the well-being of local communities. One example was described by Costa (1992): the government planned to introduce mullet cultivation through floating nets (*cercos flutuantes*) instead of supporting the existing technique of the traditional *cerco* made of bamboo poles. In fact, floating nets are more capital intensive, less labor intensive and would disrupt the existing social organization. In the end, the new technique was eventually rejected by the artisanal fishermen.

Another threat exists when environmentally protected areas are planned and established. Some of the coastal national parks are being set up in areas traditionally used by artisanal fishermen. The well-conserved areas of the Atlantic Forest and associated coastal system have been used by traditional communities for centuries. Due to their isolation as well as to the existing social structure of these communities, those areas remained well-conserved. However, due to existing legislation, the traditional population cannot live in the regions that became protected and have to be transferred to other areas. Highly conflictive situations are being created in almost all protected areas and local communities resist eviction from their traditional land (this is the case in the Ecological Station of Juréia, the Biological Reserve of Guaraqueçaba, etc). When eviction of traditional peoples occurs, environmentally protected areas are more easily invaded by commercial fishing and logging, and the overall situation becomes even worse.

Instead of using traditional knowledge, some environmental agencies are in fact destroying a suitable basis for environmental and social planning. The present situation is gradually changing in favor of traditional communities, particularly due to the fierce resistance of the traditional peoples of Amazonia. Rubber tappers and Indians succeeded in convincing the federal government to create extractive reserves through which the traditional use of forest products is ensured. Other traditional populations of the coastal areas are now requesting the same treatment granted to the rubber-tappers. Now the concept of extractive reserve is by law applicable to other ecosystems where local population live out of extractive activities, such as oyster and mussel extraction (Cunha, 1992).

Common Property, Open Access and Livelihoods

The various forms of territoriality, communal use of the commons and traditional management along the Brazilian coast described earlier should be understood within the specific

historical evolution and social contexts of the local communities involved. As is mentioned by McCay and Acheson (1987):

> *"One cannot properly generalize from the tragedy-of-the-commons model without incorporating contextual factors (Vayda 1986) such as, for example, the presence or absence of rules about uses of the commons, alternatives to exploitation of common resources, ways of monitoring and controlling the behavior of others in a commons, and so forth". (p.06)*

Each of the systems described should be analyzed in the context of specific modes of production and their interrelationships with the dominant, capitalist mode of production. This analysis, however, is beyond the scope of the present paper and should be the object of further research. There is a common feature in the systems described: they are part of the petty mode of production as artisanal fishermen produce part of the fish for subsistence and part as commodities. Most of the production is done by family members and sharing is more usual than wages. The surplus is relatively small and capital accumulation is virtually non-existent. The links with markets are also strong in some situations (as it is the case in Sepetiba Bay) and weak in others (in the *cercos*). The importance of each of the traditional management systems described earlier is dependent on various socio-economic factors, but it seems that the more the area and its economy is integrated into the capitalist system, the higher the degree of disintegration.

In this connection the processes described earlier are not simply traditional management techniques that can be directly translated into modern western management practices. The territoriality involved in the *caiçaras* of the Mundau-Manguaba coastal lagoons is a result of a complex process of social and cultural reproduction of the local communities. The *caiçaras* are in fact a way of ensuring access to scarce fishing resources within the broader context of the livelihood of the fishermen communities. The growing number of "caiçaras" should be understood within the context of the expansion of sugar-cane plantation and urbanization that expel a larger number of peasants to the "commons": the lagoon is the last resource space from which the newcomers can get their livelihood. However, the system will survive as long as the *caiçaras* owners respect the territories of others, and the sociocultural values associated with them. It is obvious that the socioeconomic reproduction of the fishermen communities is linked also to the maintenance of the law of respect as well as to the overall ideology that ensures the social integrity of the local communities, including myths that explain the biological reproduction of fish species, described by Marques (1991).

A different situation is represented by the earlier described sequential net casting in the *manjuba* fishing and in the closing of part of Sepetiba Bay for traditional fishing as a measure against outside trawling. In these cases, particularly in the last one, local communities have taken steps to assure their traditional rights over a territory that according to the present Brazilian law is "common property" in Hardin's terminology. It is a reaction against a changing biological (less fish available) and social (presence of outsiders) situation.

In this context, in the past, the coastal ecosystems in Brazil were not a common property of free access as described in Hardin's (1968) model. They were ecological and social spaces marked by territorialities, communal, family and also private property. They became in fact "common property" in Hardin's meaning by the expansion of capitalist accumulation in the fisheries industry, tourist and urban expansion, etc. As was mentioned earlier, the planned intervention of the State through the creation of capitalist fishing companies in the 1960's needed an "open sea" with no traditional rights, territories and management schemes. It was in fact a condition for capital accumulation through industrial fishing. As Johannes (1977) points out also in Brazil, forms of marine tenure other than open access suffered attrition due to the effects of modernization and the imposition of the western tradition of coastal marine resources open to all citizens.

As McCay and Acheson (1987) properly argue, the thesis of the tragedy of the commons fails to recognize common property as a result of a specific evolution of Western laws and regulations, in which there were not relevant institutions and common property as a social institution.

Like in many situations of Third World countries traditional territorial use rights are an indispensable condition to achieve and maintain sustainable livelihood security. (Chambers, 1987). As the Advisory Panel on Food Security, Agriculture, Forestry and Environment to the World Commission on Environment and Development (Food 2000) points out: "Security refers to secure ownership of, or access to, resources and income-earning activities, including reserves and assets to offset risk, ease shocks and meet contingencies. Sustainable refers to the maintenance or enhancement of resource productivity on a long term basis" (p.3).

The maintenance of a sustainable livelihood is central also for environmental purposes, in order to ease the increasing pressure on common resources. As Chambers points out (1987), sustainable livelihoods in those resource-poor areas are ecological and political safeguards against pillage and degradation by commercial interests and the rich. When poor people have secure rights and adequate stocks of assets to deal with contingencies, they tend to have a long-term view and protect their resources. In this respect their time perspective is longer than that of commercial interests concerned with rapid and easy profits. Secure tenure and rights to resources and adequate livelihoods are prerequisites for good husbandry and sustainable development.

The question of equity can also be seen within the framework of livelihood. As can be inferred from the lunar/tidal fishing described by Cordell (1983) in Bahia, the access to scarce resources by outsiders is regulated by social rules such as godparenthood (*compadrio*). An outsider can have access to the fishing resources of the Valenga estuary by seeking the favor of a "godparent" (compadre) in the village. Rights to waterspace are created, extended and transferred in ritual contexts particularly through godparenthood and long-term apprenticeships. Limited entry principles are contained in the operation of the local apprenticeship system, which governs access to the fishing space according to the lunar/tidal cycle. Fishermen's own version of the law of the sea exists in the form of voluntary organization, cooperative ethics and collective policing of territories.

The solidarity and conviviality that frequently exists among artisanal fishermen in Brazil does not mean that the community is a homogeneous entity. To ignore conflicts within the community is to open the way for the notion of a romanticized village life. This idea does not fit in today's Brazilian fishermen village. They are not isolated entities but part of the present Brazilian conflict-ridden capitalist society. One can hardly speak of a "subsistence" fisherman community in Brazil. Virtually all of them are articulated with the national capitalist formation through a series of mechanisms such as the selling of the fish to middlemen, the establishment of purchasing branches of fishing firms within fishing communities, hiring of traditional boat captains as industrial boats crewmen, etc. (Diegues, 1983).

In this connection, as McCay and Acheson (1987) point out, the common property status of resources is neither a necessary nor a sufficient explanation of resource depletion and economic impoverishment. These problems may be more closely related to capitalism and other manifestations of a colonized and industrialized world than to common property *per se.*

Potential for Integrating Traditional Management Schemes and Sea Tenure in Modern Coastal Management in Brazil

As Cordell points out (1983),

> *"Sea rights in traditional fishing are hard to defend, because they are hard to define outside a total social context. In Brazil, fishermen's highly developed, culturally shared sense of marine property cannot be mechanically legislated. The configuration of fishing territories can be mapped and legalized, but only the ideology of sea rights, consensual agreements, and reciprocities make the territorial system work. Sea tenure patterns along impoverished tropical coasts often embody elegant and proven spatial solutions for fishery management problems. Together with traditional systems of ecological knowledge of the sea, they are valuable resources in themselves, worthy of preservation. They could be used to enhance marine protection if, for instance, customary fishing rights were officially recognized where biological data are too fragmentary to build a case for conservation solely on the fluctuation of fish populations." (p.25)*

In spite of the threats described above, traditional management and sea tenure still have an important role to play in fisheries and environmental management. These structures, however, cannot be transposed mechanically onto so-called modern fishery management. As Stocks (1987) points out, resource management can be seen as human behavior that has the effect of controlling natural resources in such a way as to meet human objectives. Most modern fishery management includes sustainable yield and economic efficiency and profitability. Traditional management has a broader set of objectives and very often economic efficiency is not the most important one. As mentioned before, it functions in such a way as to include the maintenance of a certain way of life and sociability. Most of the regulatory measures proposed by the Brazilian Fisheries Management Authority (IBAMA) (quotas, licensing) are a mechanical transposition of those existing in Northern countries, where the ecological and social context is radically different. They, in fact, aim at controlling the fishing effort of the industrial fleet, maintaining or increasing economic profitability without taking into account the social, economic and cultural contribution of small-scale fisheries to the regional economy, such as employment generation, environmental conservation, etc. The result of the present management legislation, based on controlling the catch of commercial species and not on social and natural ecosystem analysis, leads to a situation of total confusion. More serious than that is the fact that traditional fishermen are punished when they break the "modern" regulations, as they fish closer to the coast and industrial boats fish out of sight of the IBAMA authorities.

Cordell (1983) advocates the integration of the traditional management schemes and sea tenure into the official fishery administration. According to him,

> *"Traditional sea-tenure systems in Bahia provide the historical, ideological, and organizational framework to initiate low-cost marine conservation reforms in coastal waters. Home-sea territories are manageable units of ecosystems and fishermen's own residential work groups, kinship networks, cooperatives and professional societies are a ready-made context for stewardship of resources. Limited entry principles are contained in the operation of the local apprenticeship system which governs access to tidal fishing space." (p. 26)*

Conflicts between artisanal and industrial fishermen, as well as between artisanal fishermen and the environmental authorities, exist all along the coast. In some cases however, the situation is changing.

First of all, this change is due to the fact that artisanal fishermen themselves have been able to force other groups including the government to respect their management system. This has happened in Sepetiba bay as described earlier. In some rivers, such as the Rio Cuiabá (Mato Grosso State), artisanal fishermen have created their own fishing reserves, imposing their regulations over other groups of commercial and recreational fishermen. In fact, outsiders were using inappropriate nets and motorboats, spoiling traditional hook fishing. Fisheries management authorities (IBAMA) intervened to transform artisanal fishermen's territories into special fishing reserves administered by fishermen's organizations. As Anderson (1987) points out in his case study in Malaysia, the near wars that followed the conflicts among artisanal fishermen and industrial trawlers can be interpreted as steps in the process of working out a way of managing the inshore and nearshore commons.

Second, the government is recognizing the role of traditional populations in environmental conservation. This recognition came after the fierce resistance of the rubber-tappers and the creation of the extractive reserves, administered by rubber-tapper organizations. IBAMA has recently created (1989) the Center for Traditional Populations in order to stimulate the participation of local communities in environmental planning and conservation. In May 1992 IBAMA created the first extractive reserve in the coastal region of Santa Catarina through which local fishermen have exclusive rights to exploit mussels and other fish resources.

Third, scientists and conservationists (including some bureaucrats from IBAMA) are now recognizing the importance of incorporating traditional management and sea tenure regulations in sustainable development and conservation plans.

Some obstacles, however, still hinder the integration of traditional management into modern legislation in Brazil. Very little research has been done so far on sea tenure and traditional management. The main cause of this lack of research is the "invisibility" and social marginality of traditional fishermen and their knowledge. Interest of researchers in these issues had increased in the last few years but is still limited.

The social and economic structure along the Brazilian coast is far more complex now than two or three decades ago when artisanal fisheries were one of the most important economic activities. Traditional sea tenure and management have to face today not only the threats of industrial fishing but also those originating from rapid urban expansion and other modern activities that compete for the same coastal space. Along with this, when a decision has to be made on how to use a specific coastal space, other interest groups have more power to impose their views than the artisanal fishing communities. Artisanal fishermen very rapidly lose control of their traditional territory and are forced to migrate to urban centers where they live in slum areas.

Artisanal fishermen organizations are still weak, although an important step forward was taken as strong social movements occurred since the beginning of the 1980s, particularly reacting against coastal pollution. Artisanal fishermen also have actively participated in providing inputs for the 1988 Constitution. The subsequent creation of the MONAPE - National Fishermen Organization (1989) has reinforced the fishermen's movement.

As social inequality is growing faster than in the past in Brazil, artisanal fishermen suffer the same consequences of this process as any powerless group. Losing their traditional territory and the space where resource management was implemented, cornered by a price system that only benefits the middlemen, they become even poorer. In this sense the assurance that they can continue using their traditional territories and their resource management might become a condition for achieving greater social equity and environmental conservation along the Brazilian coast.

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THE CLASSIFICATION OF LIVING BEINGS AMONG THE FISHERMEN OF PIRATININGA, RIO DE JANEIRO.

***Gláucia Silva*[1]**

Our goal here is to study the logic underlying classifications of living beings made by fishermen of Piratininga, a beach in the municipal district of Niterói. To do this, we have been in contact with these groups for 18 months and lived there for 2 months.

Approximately 80 fishermen (native categories will be pointed out initially) live there, near the beach or around the lagoon. They are all small-scale fishermen in the sense that none of them possess big boats, but most own canoes that can be adapted for fishing in the lagoon (considered by them as less risky, with the advantage of enabling the participation of their wives) or at sea, where a bigger canoe (of about 20 meters) is required and is usually equipped with a motor.

The mode of sea-fishing most used locally is the casting away. Fishermen set out to sea and the net is cast wherever the captain decides, this being different from the beach seine that requires a man to watch the fish from land. The division of the catch is made according to the role played by each fisherman in the *companha* (fishing labor unit).

Nevertheless, lagoon fishermen have been facing some problems. The lagoon was formerly as rich in fish as the sea but nowadays, due to the blocking of channels, lacustrine life is being threatened. If the demands of fishermen - dredging of the garbage accumulated and opening of a channel that will let the sea water in - are not carried out, the lagoon will soon cease to exist. Those who fish exclusively in the lagoon are confined to casting their nets and *puçás* to catch shrimp or crab at the Camboinhas Channel (that connects this lagoon to that of Itaipu) or else to go fishing in Itaipu.

In talking about their lives, people frequently highlighted themes of struggle and suffering, consequences of constantly dealing with adversity. These are seen as resulting from the battle between the fishermen and all those factors considered by them as uncontrollable, which are present in the wet as well as in the dry world. The unpredictability is a constant threat to survival on land and the sea, in the struggle to catch fish, when facing the winds or the impositions of a "market" where so unequal parties compete.

The position of a small-scale fish producer borders on marginality, especially in Piratininga, where the death of the lagoon prevents many fishermen from working. They are ignored by the institutions in charge of assisting fishermen and regulating their profession and must compete with the *traineiras* (seines) coming from other beaches, that catch much more fish than they do with their canoes. They are also at a disadvantage when facing the buyers of their products who are usually owners of fish shops and who offer prices according to the amount of fish they already have in stock. When there is plenty the price they offer is too low and the fishermen consider this a kind of theft. Seeing themselves forced to sell for a price lower than the one expected is frequent and some fishermen prefer not to set sail.

Another symptom of this uncertain social condition is the way in which the Fishermen Guilds (*Colonias*) act, neglecting the inspection, allowing real and false fishermen to compete for the fish thus increasing the difficulties of survival, mainly in the lagoon.

Fishermen recognize changes in their working life and also their district, which means to them not only the material environment in which they live, but represents a sort of "host" that may or not provide for the well-being of its "guests/inhabitants". Some speak of their gratitude to Piratininga, a place still good to live in. But the changes mentioned in their words and stories may

[1] Anthropologist. Master thesis, PPGAS/Federal University of Rio de Janeiro.

indicate that it is on the brink of becoming a place where the social reproduction of these small-scale fishermen will be more and more in doubt.

To analyse the central object of this study we have taken into account those concepts that regard what we allowed ourselves to call "native classifications", as expressions of an organizing logic, expressed by Lévi-Strauss (1978) and known as "totemism" - possibly one of the revelations of the "primitive thought" and a cognitive alternative for the understanding of the world.

The "primitive" notions are a type of classification that establishes codes of metaphoric, metonymic and analogical correlations between culture and nature in such a manner that both realms of different sizes and natures are allowed to gain "magical" communicating bonds and interact with one another. If such bonds end up bringing these two realms closer it is because they are conceived as distinct and different while interrelating with one another, forming one another and conforming to one another.

The "savage" thought is similar in some points to the taxonomy of the biological sciences; nevertheless, possibly the most important fact is that both are an answer to the very same "demand for order" mentioned by Lévi-Strauss (1978), which underlies all cultural configurations. Another aspect of it is that of conforming to an aesthetic intention.

As the totemic phenomenon owns a logic which allows an approximation (mostly an analogical one) between nature and culture, creating distinctions inside society and also drawing boundaries between both realms, it allows a conception of the universe that may be called holistic (Dumont, 1966). Lévi-Strauss did not explore the issue of hierarchy, which would seem especially productive when analyzing the categories that make up the world view of the fishermen of Piratininga regarding natural representations, which maintain "hierarchical" relationships following a logic very similar to that discussed by Dumont (1966).

We approach the main topic of our study from this point of view. The study is divided in three sections: the first one discusses the category Nature, its features, interrelationships and the two great complexes into which it is divided (land and sea), in an attempt to delineate the specificity of the "living" within this context. The second chapter analyses concepts more strictly associated to the ordering of living beings, in other words, "plants" and "vertebrates", pointing out their specific logic. The third chapter brings the main ideas that support biological taxonomy currently and in the past, followed by a comparison between the wider guidelines of both "scientific" and "native" views. The conclusion provides a brief summary of the issues discussed in the sections.

Nature's phenomena are understood by the interviewed fishermen as instruments of divine will, acting on one sphere but following the commands of another, thus linking the supernatural to society. In other situations it was apparent that, according to them, the sacred dimension itself presents qualities only God can possess. Strength, perfection and purity are essentially features of Nature but many belong partially to men, who can express their strength while working with fish, winds, rains and currents. Men can show their creative force through art as the sea that shelters so many fish and living creatures or as the woods and land, upon which vegetation grows. Nevertheless, only Nature has command over the cosmic forces such as the force of the moon and of the months (*força dos meses*), which Men can only observe, never discovering its mysteries. Human beings can only try to influence their own destiny through prayer and faith that are means of reaching out to God, causing him to be moved by fishermen's suffering.

Recurrence of natural manifestations is evidence of purity. The phases of the moon, the tides, the seasons of the year, the phases of the lives of fish, winds and rainy periods have a recurrent nature which guides the fishermen at sea as well as on land so that they tell when and how to set out to sea. Nevertheless, sometimes it is impossible to find the fish and all efforts prove to be in vain; all knowledge insufficient to face God's mysterious decrees. Nature has its own cycles but the fisherman does not always manage to fulfill the stages he would like to in his daily life, thereby obtaining a state of plenty. When he sets out to search of fish he obeys an unpredictable cycle. The sad side of the fisherman's life is the unpredictability imposed by the fitful behavior of fish (in obedience to a higher sphere) or by the market which, being as imperfect as many other social accomplishments, only brings disadvantages to small-scale fishermen.

Fishermen's traditions are the ones they can express as being pure and natural, as if the preserved habits were social forms in a society created by the repetition of nature. Therefore, the movements that characterizes living nature must be presented in the social realm but equally in its pure form, the cyclic form. The unexpected brings struggle, work, risks and in extreme cases a threat to life, which in the dry world appears with changes. Change has a strong anti-life connotation for it is seen as an attack on nature which changes its cycles, weakens its strength and kills the lagoon. It is also, on the other hand, an attack on the traditions that reveal social purity.

Perfection is a natural quality that highlights the adequacy of each natural being's existence, for each has its own purpose even if unknown to men. In other words, even if we do not know its immediate use, the fulfillment of a divine wish is enough to make it legitimate. Human beings can share divine perfection when they meet their familial and professional responsibilities, behaving in an adequate manner or in the way society expects them to.

As described before, fishermen understand nature as made up by two vast worlds: sea and land. Distinctions between these two worlds are an important basis for classification since animals and plants are understood and organized according to the fact that they belong to one or the other domain. Those living on land are seen in a relationship of contiguity with fishermen and classified according to criteria such as social humanity. Those living in the sea are linked to land by analogical relationships, this world being perceived as an imitation of land reinforced by the similarity of form between the beings of these two "worlds".

Fish have a great importance in native classification, being the most meticulously classified in categories built upon aesthetic criteria. This deference to fish is made clear by the use of the "family" category that is meticulously applied to fish while receiving quite casual application in the case of other animals and especially plants. This special treatment given to fish should be seen within a set of conceptualizations that approximate them to man since both form the articulation between land and sea.

Native classification also employs typologies. According to these typologies the beings grouped in each class must present the greatest possible amount of characteristic features in order to be identified. Besides this rule, based mostly on shape and external appearance, there are also "situational incorporations" between classes so that labels attributed according to essences are articulated by a kind of "hierarchy" of complementary opposition, whose terms relate to each other in different ways, according to the referential context. This "hierarchical" understanding is very different from that of present biological taxonomy which establishes a subordination even between categories.

To formulate their classificatory systems fishermen take into account not only the aesthetic features of the being but also other dimensions such as habits, uses and sympathetic relationships that may have been established. In short, everything that is sensed or known about an animal or plant that links them to society. In the words of Foucault: the "semantics" of being. This alternative ordering reveals their goal of organizing the world according to Men, the one that "uses" the world. Man is a creature like other creatures but different because it was the only one created to the likeness of his Creator. Thus, he can occasionally be invested with divine qualities and then all must be prepared so that his will may be done.

Although the above mentioned holistic viewpoint, together with a kind of classification based on typologies and criteria which allow for the incorporation of "semantic" and ordering classes, connect the structuring logic of native conceptions to that seen among the first naturalists and the philosophy of today, there is a gap between the two formulations which seems to have been basic to the constitution of the second vision, the "scientific" understanding of reality. In other words, fishermen articulate their knowledge about nature in two ways: extending to it their own intellectual and volitional abilities and accepting some of its phenomena as unexplainable mysteries that they prefer to admire rather than to disclose. According to Foucault, biology could only come into being with the abstraction of the notion of life. Another factor ripened along the centuries in which the knowledge of men pursued a natural logic -- the idea that man is only a version and not a landmark within Nature. This gradual questioning of anthropocentrism seems to have had great influence over the process of building the new mode of knowledge.

The great distinctions between the "scientific" conception (intellectualized and tending to form a knowledge based on "objectivity") and the native one (holistic and totemic) do not overshadow what both have in common for, to return to Lévi-Strauss (1966), they not only share external criteria but also answer to a "demand for order that is at the base ... of all human thought".

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TRADITIONAL FISHERIES KNOWLEDGE AND SOCIAL APPROPRIATION OF MARINE RESOURCES IN BRAZIL[1]

Antonio Carlos S. Diegues[2]

Introduction

This paper examines the relationship between traditional fisheries knowledge and contemporary fisheries management in Brazil.

In recent years, researchers have emphasized the importance of the knowledge produced and orally transmitted by traditional fishermen and the potential role of traditional fishing and related environmental knowledge can play for the development and implementation of fisheries management in the modern world. (Ruddle 2000, Cordell 2000). As Ruddle (2000) points out, traditional knowledge continues to guide and sustain the management of many traditional, community-based fishing systems as well as governs fishing decisions and fishing strategies. Local knowledge systems are empirically-based and designed for practical purposes, for example to inform decision-making about where to dish daily and seasonally. Local environmental knowledge domains characteristically include much valuable information about fish behavior, location, distribution and availability of species, taxonomies and habitat classifications. Over time, as this knowledge is transmitted to new generations of fishermen it helps communities maintain and constantly renew ties to to fishing grounds and access to a continuous supply of marine aquatic resources, particularly in tropical countries where biological data are scarce or no-existent.

Spheres of local knowledge also include references to classification of aquatic species, fish behavior, taxonomy, patterns of reproduction and migration, feeding interrelation among species, to physical and geographic characteristics of the aquatic habitat, climate (cloud formation, winds, storms, weather change), principles of navigation and functioning of diverse fishing techniques in a range of micro-environments. Traditional knowledge may also reflect people's association and connections with the spiritual world, for example, demarcation of sacred sites in the sea, creation myths and story places.

1. Areas and subjects of traditional knowledge

Various maritime anthropology and ethno-ichthiology studies illustrate the richness and resilience of artisanal fishing knowledge in Brazil. Gláucia Silva (1997) records the analytical categories of the fishers of Piratininga (Rio de Janeiro) and Begossi (1989) documents the species nomenclature and criteria for fish classification system fishermen use in Búzios Island, (Sao Paulo). Cunha and Maldonado (1989) have described how fishing knowledge operates among artisanal communities and the know how of fishermen in Paraná and along the Paraíba Coast. Diegues (1983, 2000) explains how traditional knowledge functions in the rocky fishing grounds of Rio Grande do Norte and Espírito Santo states. Forman (1970), Cordell (1974), Mourão (1967) and Marques,(2001) have made important contributions to the study of traditional knowledge in Brazil.

Thus, *traditional fishing knowledge* may be understood as a distinct cognitive realm: on the one hand consisting of a replicable, orally transmitted set of specialized skills and culturally shared practices and beliefs that have stood the test of time, enabling people to make a living from coastal and marine environments, working from small boats and relying on artisanal techniques; on the other hand traditional fishing knowledge exists in more encompassing symbolic and conceptual

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[2] Anthropologist, University of São Paulo

frameworks governing social relationships and spiritual connections to inland aquatic, coastal and offshore marine habitats.

It can also be defined as a cumulative body of knowledge and beliefs handed down through generations by cultural transmission about the relationship of living beings (including humans) with one another and their environment. (Berkes, 1993)

Some areas and subjects of traditional fishing knowledge are:

a) Fish taxonomies

In some Brazilian fishing communities, fish have a great importance in native classification, being the most meticulously classified in categories built upon multiple criteria. This deference to fish is made clear by the use of the "family" category that is meticulously applied to fish while receiving quite casual application in the case of other animals and especially plants. This special treatment given to fish should be seen within a set of conceptualizations that approximate them to man since both form the articulation between land and sea.

> *" Native classification also employs typologies. According to these typologies the beings grouped in each class must present the greatest possible amount of characteristic features in order to be identified. Besides this rule, based mostly on shape and external appearance, there are also "situational incorporations" between classes so that labels attributed according to essences are articulated by a kind of "hierarchy" of complementary opposition, whose terms relate to each other in different ways, according to the referential context. This "hierarchical" understanding is very different from that of present biological taxonomy which establishes a subordination even between categories."(Silva, G. 1997)*

b) Habitats classification

In addition to species of fish, certain rocky fishing grounds are classified and designated by names of fishermen who discovered them. (Cascudo, 1954, Galvão, 1968, Diegues, 2.000). Some of these rocky habitats are very rich in fish species and kept secret by their "owners". These territories have no visible markers or borders, but are respected by other fishermen. Local sea tenure systems are based on long established knowledge traditions containing retailed information on ecological features of the sea territory.

Cunha's (1997) highlights the relationship fishermen perceive between physical characteristics of the ocean and the social production of knowledge. According to Cunha, fishing knowledge is culturally produced and accumulated through professional practice and continually recreated according to the features of the maritime environment, which presents itself as cyclic, mobile, and unpredictable. In other words, the appropriation of the sea and its resources is expressed in the principle and practice of "knowing-how" marine territory is constructed and ritualized by means of tradition, apprenticeship, experience, and intuition. This know how is only attainable by those with experience and intuitiveness that comes from understanding what tradition is in specific cultural and work/production contexts of fishing apprenticeships.

Several authors (Diegues, 2000, Cunha, 1997) emphasize the relationship between the combined land and sea space where fishermen live and do their work.

> *" Fishermen understand nature as consisting of two vast worlds: sea and land. Distinctions between these two worlds are an important basis for classification since animals and plants are understood and organized according to the fact that they belong to one or the other domain. Those living on land are seen in a relationship of contiguity with fishermen and classified according to criteria human characteristics. Those living in the sea are linked to land by analogical relationships, this world being perceived as an imitation of land reinforced by the similarity of forms between the beings of these two "worlds".(Silva, G 1997).*

c) Fish behavior

Detailed feeding habits are described by fishermen (Marques, 2001) in Marituba lagoon at the mouth of São Francisco River in the state of Alagoas. Local fishermen describe fishing habits of many species and use their knowledge to select appropriate baits. Knowledge of feeding and reproductive behavior are also used to organize fishing activities. As an example, during the first

rains, when fish makes noise ("snores") this means they are ready to spawn; thus it is time to prepare fishing traps (covos).

Marques (1991) has studied the *caiçaras,* a brush park used in the coastal lagoon of Mundaú and Manguaba, in Alagoas from an ethnoichthyological point of view. He observes that fishermen distinguish fish which live in the caiçara more or less permanently such as the *mero (Epinephelus), carapeba (Eugerres brasilianus), camurim (Centropomus* spp), *caranha (Lutjanus cyanopterus)* from species which only temporary seek shelter in the brush-parks, such as the *salema (Archosargus* sp) and *vermelha* (*Lutjanus spp)*

The movements of fish and their migration patterns are also precisely known by many artisanal fishermen in Brazilian coast. A good example concerns the migration of mullets (Mugilidae) during the winter from Brazil's southern to the northern coasts. The first cold winds in May mark the beginning of the mullet migration. Numerous artisanal communities continue to rely heavily on this species for their livelihood. (Mussolini, 1945)

The ability to locate and keep track of fish aggregations is another realm of fish behavior known in intricate detail by many small-scale fishermen in Brazil. Signs of spawning aggregation are identified by "ardentia", the scintillation produced by shoals of certain pelagic fishes (such as sardines) during the nights without moon light. This indicates that fishermen should prepare to deploy their encircling nets.

Ruddle (2001) also mentions that knowledge of predictability of food fish in "prime spots is widespread in traditional fishing societies throughout the Tropics. Calendar devices and mental maps which enable fishermen to track fish behavior according to lunar phases are among the most critical indicators of possible events in the marine ethnobiology of fishing.

2. Social and cultural characteristics of the knowledge

The knowledge systems described above tend to develop within traditional societies or communities that: a) maintain strong economic and symbolic ties with the land and the sea through continuous observation of natural cycles; b) attachment to continual use and occupancy of a specific group territory which allow a community to reproduce itself through ongoing traditions of communal and family land and sea tenure; c) where subsistence activities continue to play a vital role in fishing, even in conjunction with and increasing focus on market production; d) individual/family ownership of means of production; e) limited accumulation of capital; f) crucial socio-economic relations that are structured along family, domestic, communal kinship lines; g) the use of relatively simple technology, with limited impact on the environment; h) positions of marginality from political power bases that tend to be concentrated in urban centers; i) oral traditions responsible for the production and transmission of knowledge, symbols, myths and rituals associated with artisanal fishing and sometimes with small scale agriculture; j) a certain degree of social/cultural identity based on fishing and other maritime activities.

Artisanal fishing knowledge should not be judged or seen as pre-logical or pre-scientific. Silva, G. (1997) following Levi-Strauss (1978) points out that traditional production and ecological knowledge is based on long observation of recurrent natural phenomena which allows a fishermen to make decisions about the timing of fishing activities, selection of favorable fishing locations and the use of appropriate techniques for specific species . Without this fine-tuned knowledge it would be impossible for fishermen to earn livelihood within an ever changing and frequently dangerous marine environment

According to Silva, G (1997)

> *"Traditional classification systems are, in some ways similar to the taxonomic concepts of the biological sciences; nevertheless, possibly the most important fact is that both are an answer to the very same "demand for order" mentioned by Lévi-Strauss (1978), which underlies all cultural configurations.*

The construction of this body of complex and detailed concepts and symbols is based on a long term empirical observation and is applied to rather small marine areas used by local fisherman and seldom can be replicated elsewhere. It also guides their behavior and fishing strategies and is

essential for predicting situations where fishing can be successful. In this sense, traditional knowledge help local fishermen to produce their own mental maps that indicates to them where and how to fish.

As Ruddle points out (2000)

> *"Resource use patterns are products not of their physical environment and its resources per se, but of their perceptions our culturally formed images of the environment and its resources. Thus, to properly understand human ecological relationships, an understanding of a society's local knowledge base, and the cognitive system that underlies it is crucial." (p.282)*

3. Transmission of local knowledge

The ability to identify productive zones of the sea and to find one's bearings in the midst of the immensity of the sea, out of sight of land, is part of what has been called "the cognitive skill set of fishermen" which seem to be the direct and accumulative result in many fishermen communities. This knowledge is not evenly distributed among artisanal fishermen but tends to be concentrated in the hands of boat captains and skippers.

According to Maldonado, 1997)

> *"it is useful to consider the seamanship and territoriality among fishers in terms of practical adaptation to the marine environment. This culturally conditioned learning accounts for the development of systems of orientation in exploiting the marine environment. In other words, seamanship and the art of fishing are socially mediated. They appear and evolve in a marine space that shape the worldview and the organization of productionof artisanal fishermen. (Maldonado, 1997)*

There are various ways to transmit this knowledge set. In the case of the retrieval of submersed rocky fishing grounds in Galinhos (Rio Grande do Norte) described by Diegues (2000) the captain may show to his children or a selected crew member the geographical signs in the continent he is using (mountains, church towers) to trace his routing. In other cases, an apprentice must learn informally through observation and imitating what the captain does. Instruction to acquire these aspects of fishing knowledge is rarely formal or consciously intentional.

4. Gender, division of labor and traditional knowledge

Traditional fishing knowledge is not evenly distributed among artisanal fishermen. Knowledge varies among communities and among their members Although old fishermen are generally considered to possess more knowledge than their younger counterparts, successful captains are not necessarily the oldest fishermen. Rather they tend to be people with natural leadership and captaincy qualities (mestrança), i. e the ability to command. In the Northeast knowledge is associated with captainship that requires competence and experience that bestows authority to orchestrate fishing operations, based on respect (respeito) gained from the crew members. Some captains are boat owners themselves but many of them work on other people's boats.

For the fishermen of Galinhos (Rio Grande do Norte), finding fishing spots is certainly not just a matter of luck. Captains must be competent to sail at nights guided by the stars in order to tocate the best and most productive fishing grounds, which they hold secret (Diegues, 2001).

Women too are skilled in locating and sustainable using shell fish beds to provide food for households when boats cannot go the sea due to bad weather. In some regions of Brazil some women go fishing with their families.

5. The traditional appropriation of the marine environment: space and sea territoriality

The concept of traditional appropriation of sea resources incorporates material as well as non-material aspects that define the relationship between fishermen and the sea. Modern concepts and tools for managing fisheries usually emphasize economic, biological and administrative aspects of regulating fisheries. On the other hand, anthropological studies of fishing have been open to

broader interpretations of what constitutes resource management in fisheries. In many cases, anthropologists have documented traditional territorial systems used to appropriate and manage sea space which have been found to have meaningful fisheries management functions and implications. Local tenure customs which control access to fishing grounds can have management impacts which are similar to the quota and limited entry provisions and restrictions employed in contemporary fisheries management frameworks.

Traditional appropriation of marine resources in some cases ends up having noticeable effects on fishing pressure and production by establishing normative procedures to control fishery access and activities within socially demarcated sea space. Such cultural practices are basically designed to allow fishing communities to intervene in nature and in the life cycles and processes of marine species. In recent years anthropologists have found this to be an enlightening way to understand and explain why tenure systems develop and how they work in many tropical coastal areas which in the past have been perceived by governments, fishery entrepreneurs and by regulatory agencies alike as open-access areas. The prevailing wisdom behind imposition of most recent fishery management regimes and legislation stems from what is turning out to be a naive and erroneous assumption about ownership status of inshore fisheries and coastal sea space, much of which has long been held and sustainable managed under pre-existing traditional tenure arrangements. The anthropological and social science literature is now replete with examples of local fishing traditions that intentionally or un-intentionally regulate access to resources and sea territory, create fishing rights and with corresponding social obligations and that regulate the use and distribution of fishing gears in order to reduce social conflicts and in certain cases to control fishing pressure itself. Also as Cordell (2000) points out, sea tenure traditions may include not only subsistence strategies by reflect basic cultural values, social identity and a sense of place.

An outcome of the traditional appropriation of the marine environment and its natural resources is the establishment of informal sea tenure systems, through which portions of the sea, including, for instance submerged rocky grounds are allocated to fishermen families. But, as Cordell (2000) points out sea tenure traditions include not only subsistence strategies but are also based on cultural values that are related to the construction and maintenance of a social identity and a sense of place.

Traditional appropriation of marine environment occurs within a broader framework of territoriality through which the artisanal fishermen of the Brazilian coast have marked areas of the sea that "belong" to them by virtue of their use.

An important element in the relation between traditional populations and nature is the notion of 'territory', which a particular society claims as its own, and grants to all or to a part of its members stable rights of access, control and use for all or part of the natural resources located there, that they desire or are capable of utilizing (Godelier, 1984). This territory furnishes, first of all, the nature of humans as a species, but also the means of subsistence, the means of production and the means of producing material aspects of social relations, such as kinship relations. (Godelier, 1984)

The marine / coastal *territory* depends not only on the type of physical environment exploited, but also on the *social relations* established among those who use it. For many traditional populations that exploit the marine environment, the sea has its *marks* of ownership, generally productive fishing spots, discovered and guarded carefully by artisanal fishermen. These marks can be physical and visible, as it occurs in the *caiçaras (brush parks)* constructed in the lagoon of Mundaú and Manguaba (in Alagoas, Brazil). They can also be invisible, as in is the case of submerged rocks where there is an abundance of fish stock. These fishing spots are marked and guarded**,** and kept secret through a system of navigation locally called *caminho e cabeço* by the fishermen of the Northeast. For members of traditional artisanal fishing communities the marine territory used is much larger than that of the land, and is more fluid. Despite this, it is conserved by a *lei do respeito* (law of respect) that governs the ethics of this community (Cordell, 1982).

Knowledge of the marine physical environment is extremely important for safe navigation, for the use of appropriate gears and for the identification of certain fish species. Among Brazilian artisanal fishermen the marine environment is not uniform but it is formed by different micro-habitats that includes mangrove, lagoons, estuaries, sand and rocky based grounds. Some

fish species are known to use different micro-habitats for different purposes such as feeding, protection and reproduction. In some cases, some micro-habitats must "rest" when some others are used for fishing (Marques, 2001).

Despite numerous advantageous uses noted here of artisanal sea tenure systems, this is not to say they present a panacea for overcoming all fisheries management problems; fishing may become highly competitive and arguably, as a work setting it seems to have an inherent tendency to generate conflict. The act of appropriating and controlling access to local sea space and resources by no means renders work environments or the natural environments- even those of small-scale fishing, free of conflict.

6. Symbolic aspects of the social appropriation of the sea

The social appropriation of the sea implies not only an extension of social relationships on land and the accumulation of local environmental knowledge. It also involves the formation and symbolic expression of links with the spiritual world. Conceptions and representations of the natural world and its resources differ greatly between the subsistence and market-oriented societies. Godelier (1984) argues that these two societies have different rationales, and each displays a system of social rules consciously elaborated to best attain a set of objectives. According to this anthropologist, each economic and social system creates a specific mode of exploitation of natural resources and use of the human labor force and, consequently, utilizes specific norms of good and bad use of natural resources.

According to Godelier (1984), at the heart of our material relationship with nature there is an underlying non-material bond that unites the three key functions of knowledge: to simultaneously represent, to organize and to legitimize our social relations and our the relations with nature. In order to understand the process of material production, it is essential to understand symbols and myths used by fishermen to represent the sea and its beings.

The production process involved in fisheries generates a range of symbolic elements through which fishermen act not only upon nature but in concert with super-natural forces that may favor a successful fish catch or punish those fishermen who are too ambitious.

Thus, together with defining a space for economic reproduction and projecting principles of social relations, marine territories can also be the locus of representations and of the mythological imagination of these traditional societies. The intimate relation of these people with their surroundings, and their greater dependency on the natural world when compared with urban-industrial societies, result in the cycles of nature (the arrival of schools of fish and the abundance of crops) being associated with mythical and religious explanations.

For example, *Caiçara* communities along the Southwest coast of Brazil use both the Atlantic Forest resources as well as associated estuaries, mangroves and marine environment. They also do not have a fear of fishing in the estuaries and coastal lagoons, but many fishermen have a dread of the *mar de fora* (open sea) and the *passagem da barra* (going beyond the mouth of the estuary),where storms might occur, sometimes resulting in loss of boats and human lives. (Mourão, 1971).

One of the most popular "orixás" (gods of the Afro-Brazilian pantheon) is Yemanjá, the goddess of the sea. She is also considered to be the Mother of the fish (Yeye: mother and Eja: fish, in Yoruba from Nigeria). The fishermen of Bahia, in particular those involved in the fishing of cavalla (pesca do xaréu), present their gifts to Yemanjá before their nets are launched from the shore. According to these fishermen, those who do not praise the goddess of the sea will have small catches, as Yemanjá protects the shoals. In the evening of February 2, coastal communities, in particular artisanal fishermen celebrate Yemanjá and throw in the sea the gifts she likes, such as soaps, bottles of perfume, and silver coins.

Another important aquatic goddess is Oxum, the spirit who protects the living beings of rivers and water sources. (Seljan, 1973)

The popular imagination of the people of the Brazilian coastal forests, rivers and lakes is inhabited by magical beings that castigate those who destroy the forests *(caipora/curupira, Mãe da Mata, Boitatá)*, those who mistreat animals *(Anhangá)*, those who abuse animals in the time of

reproduction *(Tapiora)* and those who fish more than necessary (*Mãe d'Água*) (Câmara Cascudo, 1972). Thus, the inhabitants of the Várzea da Marituba in Alagoas have various legends, such as the *Mãe d'Água* (water mamma) which sinks the canoe of those fishermen that are very ambitious and catch an unnecessarily large amount of fish from the lagoon.

Mythological beings called "ataídes" threaten those fishermen who use the mangrove without care in Marajó Island. In the lake Arari, also in the same island, fishermen say that there is a spirit of a big ray (arraia grande) that protect other fishes from human predation when they become trapped in small ponds during the dry season and are an easy prey of fishermen. In order to fish in those ponds it is essential to ask permission from the "big ray" otherwise the fisherman may risk his life. (Fares, 2001)

The mythical world of "caboclo fishermen" of the Amazonian rivers and estuaries is filled with spiritual beings or *encantaria* of the forest or water, that can favor or harm him.

The worlds of forest and water are two separated domains: two extensions of the fishermen/*caboclo's* lives. There are supernatural entities (*caruanas*, *bichos do fundo* [animals of the depth], *mãe d'água* [water's mother]) capable of casting spells or haunting and bewitching those who abuse or disrespect the rights and rules pertaining to the use of these environments. In this case, a belief that one should not harvest more than one needs is reinforced. Like the forest, aquatic areas along with their human inhabitants also have their protective spirits, with the power to harass those who engage in destructive resource use. There also exists the *cobra grande* (great snake), the *Tapiraiauara*, and the *onça d'água* (water leopard), which inhabit, respectively, the depths of lakes and the rivers (*igapós).*

Fishermen understand they must avoid fishing in certain places and times for fear of meeting supernatural entities. It has been suggested that this fearfulness may act as a mechanism for limiting potentially damaging human-environment interactions, thus tending to prevent over-exploitation of resources. (Furtado, 1997)

An ongoing debate surrounds the natural resource conservation function of these mythological beings. In other words, are traditional fishermen aware of the ecological intentions of these cultural practices. Can such practices actually facilitate conservation or be viewed as "conservationist"?

Darrel Posey, (1992) uses the emic/ethic approach to discuss the issue of intentionality related to traditional practices. According to him, in some conservationists' minds traditional practices that limit overexploitation of resources can be considered to enhance or support biological conservation, in the modern, scientific sense. Under these conditions, whose practices mediated by beliefs in mythological beings purposely choose to avoid over fishing may play an important role in modern fisheries management?

For Posey, this interpretation falls into the category of an ethic approach that is developed by the researcher. On the other hand, in the mind of a traditional fisherman (the emic approach) the function of beliefs about the behavior of mythical beings may turn out to be something quite different. Fear of being punished by super-natural beings may function, for instance, to discourage capital accumulation and social differentiation in societies organized along egalitarian lines. In this connection, an emic approach to explain these practices is unlikely to be deliberately "conservationist", at least not in the sense this concept is defined in the Western science.

Inhabitants of many fishing communities in Brazil retain socio-cultural affinities with their Indian ancestors. Indian cosmologies usually do not make clear cut distinctions between animals and humans but see life as a continuum in which all beings are inter-related through a network of different sociabilities. (Descolla, 1997). Nature is not only inhabited by humans and the spirits of the ancestors but also by animals and their spirits. In this connection, the modern concepts of wilderness, biodiversity, pristine ecosystems are not able to explain the complex relationships between traditional communities and their environments. For example, in the worldview of these communities and cultures, the existing diversity of species is not only a natural phenomenon but also a cultural one resulting from a long term interaction between humans, habitats and non-human beings.

In the Brazilian context, several traditional groups are currently making efforts to incorporate the modern notion of "conservation" in their discourses in order to gain the support of ecologists in their struggle for cultural survival.

7. Examples of Sea Tenure and Traditional Management Schemes on the Brazilian Coast and rivers

In Brazil there are over 200 different Indian peoples, with their own language and cultures, some of them living and fishing in coastal areas (Guarani, Tremebe, Pataxó). There are also non-Indian traditional communities that have important influence from the Indian cultures in their way of living. There are the "praieiros" in the Northern coast, the "jangadeiros" (raft fishermen) in the Northeast, the "caiçaras" in the Southwest region, the Azorean descendents in the South, as well the "caboclo" fishermen along the rivers and lakes.

Traditional appropriation of marine/riverine resources and sea tenures have been touched in the preceding discussion of cultures and sea tenures. Salient aspects of a number of these traditional knowledge, tenure, resource and spatial management systems are described in further detail below although it is important to point out that much more research and documentation is needed to begin to do justice to this topic.

Caiçara / pesqueiros (brush parks)

This is a brush-park built with mangrove poles making a circle or a rectangle. Inside it the artisanal fishermen lay branches. It is similar to the *akadjás* described in Benin by Bourgoignie (1972) and by Kapestky (1981). The similarity between the Brazilian *caiçara* and the African *akadjás* was first mentioned by Diegues (1983, 1988).

It is not yet known whether this technique was brought from West Africa by the African slaves or developed locally. *Caiçaras or pesqueiros* are known and used by many fishermen communities.(Diegues e Negara, 1994) In Mundaú-Manguaba lagoons in the state of Alagoas they are in shallows where there are weak water currents. Fishermen have a profound knowledge of the fish species that are caught in the brush-parks.

Fishermen are also aware of natural processes within the *caiçara* as an artificial habitat they have created For instance, they recognize different stages of ecological succession. According to Marques (1991) they are equivalent of what is known in modern science: in the poles first settle the macroalgae (*cabelo*), then the perifiton (*limo*), the Terrinidae (*buzame*), *Mytella charruana* (*sururu*) and *the Crassostrea rizophorae* (*ostras*). Each stage is associated with a specific fauna. When the climax is reached fishermen net fishing the adult fish, leaving the juveniles for latter fishing.

In summary, " caiçaras are":

a) *a system of sea tenure*: Local fishermen informally own the space where the caiçara is settled.. Access to the newly created habitat and its resources is determined by the law of respect (*lei do respeito*). As the fishermen say: "We cannot forbid other fishermen to fish in the caiçaras, but they respect our place as we respect theirs".

b) *a unit of resources*: the fishermen have an idea that the *caiçara* concentrates biomass.

c) *a fish aggregating device*: fish species find a new habitat and a feeding place in the *caiçara*. Local fishermen say that "fish go to the *caiçara* to find safety. (Marques, 1991).

d) *a fisheries management technique*: local fishermen utilize these new habitats in a responsible way, using appropriate nets that catch only adult fish. In a broad sense the *caiçara* can be also considered an extensive aquaculture technique, as was noted by Kapetsky (1981).

The brush-parks of Alagoas State, however, are now suffering from the overall degradation of the Mundaú-Manguaba lagoons. Tons of wastes from sugar-cane alcohol production are being discharged into the lagoons. The urbanization of the state capital, Maceio, is also responsible for the overall degradation of the estuarine area and contributes to the disruption of the fishing communities. As local fishermen say: "Outsiders who are not local fishermen lack respect and take fish from our *caiçaras* in the night."

The *calão* Fishing of Southern Bahia

This type of fishing was thoroughly described by Cordell (1983). It is a type of shallow-water purse-seining in which an eight-man crew works in six- to ten-meter canoes. Purse seining is well adapted to the intricate tidal changes along Bahia's estuaries and creeks that wind back into the mangrove swamps.

Cordell (1983) also explains that the skippers (*mestres*) have consolidated control over premium waterspace, which has distinctive spatial limitations within the lunar/tidal cycle, providing a territorial foundation for the marine tenure system. Names are given by the skippers who exercise exclusive rights and priorities over these tiny tidal fishing spaces. He has also observed that the skippers give names to the traditional casting spots (called *pesqueiros*) that are microenvironmental areas for fishing. They are subdivided for a particular fishing technique into *lanços* (casting sites) or minimal waterspace as determined by fort-nightly current changes, daily tide-level changes, light conditions during different phases of the moon, bottom conditions, etc.

Cordell (1983) also mentions that fishing rights and property exist as spatial points in the context of the lunar calendar.

Access to others can also be granted by the skipper in the context of godparenthood (*compadrio*), networks, rituals and obligations. When an outsider fisherman wants to fish in the estuary he usually takes along a crew member who has a local godfather (compadre) or friend. It is a precaution to ensure that his crew will receive good treatment if they have to go ashore and thus avoiding the threat of competition during net-casting operations.

In thee case of Mundau-Manguaba lagoons, the estuaries of southern Bahia are suffering from outside interference, mainly incursion of industrial fishing boats that do not have the respect and engage in "pirating" resources in the customary territories of traditional fishermen.

The *Caminho e cabeço* routing and rocky bottom fishing of the Northeast

Caminho e cabeço is a fishing system in which a fishing ground is discovered and pinpointed in the ocean through a complex method of mentally constructed reference points. Fishermen use no compass but still by crossing imaginary lines (caminho/routing), and referring to geographical landmarks such as the top of continental mountain range, they are able to retrieve small fishing grounds made of rocky bottoms (cabeços) several miles away from the shore. These fishing grounds become "owned" by the boat captain or skipper who discovers them. Other fishermen do not know where these grounds are located. Some boats might follow the lucky owner of a fishing ground but when the skipper becomes aware of this, he changes his route. After some years, some of these productive fishing grounds might be made public but keep the name of the skipper who discovered them. The secrecy of the cabeços are transferred from the father to his children or selected crew members.

This system was first described by Galvão (1968) in the state of Rio Grande do Norte. Later on, Forman (1970) analyzed the system in the state of Alagoas. According to Forman, the secrecy is the core of that type of fishing and it is a way of diminishing competition for scarce resources. The *segredo* (secrecy), based on traditional knowledge, is a sign of authority of skippers over the other fishermen. The more *cabeços (rocky grounds)* he discovers and keeps secret, the more fish he lands and the more respect he gets within his community. As a fishermen from Galinhos (Rio Grande do Norte) points out: "The sea has plenty of marks that nobody sees". The "caminho e cabeço demonstrates territoriality and functions also as a means of controlling the availability of scarce sea resources in the Northeast.

Cercos* and *Currais

(Bamboo Fishing Trap)

These are fixed traps built in many estuaries and lagoons all along the Brazilian coast. They were first built by the Indians to catch migratory species such as mullet. They are made of local material such as bamboo poles. They have one entrance that allows only big fish to get in, as the small ones escape through the fence. The owner of the *cerco* rebuilds it every two years when the

bamboo poles decay, and when it is abandoned, another fisherman can build his own *cerco*, after having the approval of the previous owner of the previous trap. No other fisherman will dare to take fish from somebody else's trap as long as the law of respect prevails. At present, however many intruders, mainly recreational fishermen, fish in the *cercos*.

Restricted Access to Fishing Grounds

According to Brazilian law, fishing is open to all fishermen registered in fishermen's guilds (*Colonias*). However, in some places, local communities have reserved specific areas for the use of their fishermen. That is the case for example, of Mamanguá estuary near Rio de Janeiro, where traditional fishermen laid cement blocks in the bottom of the sea to damage large trawling nets. Artisanal fishermen use only small nets to catch shrimp and felt that their fishery was being damaged by industrial boats from companies. Today the area is used only by the traditional community as the trawler owners are afraid of entering into the restricted area and damaging their nets. (Diegues and Nogara, 1994).

Organized and Sequential Net Casting

Artisanal fishermen are often accused of being disorganized, anarchic and not receptive to management. In fact, what happens is that fishermen organize themselves. That is illustrated in the "manjuba" fishery *(Anchaviella hubsi)* inside the estuary of Iguape-Cananéia in São Paulo coast. Due to the construction of a barrier in the Ribeira River, the migration of manjuba changed. As a result, fishing is primarily concentrated at the mouth of the river. Hundreds of canoes converge during the short fishing season in a narrow area. In order to ease confusion, fishermen have developed a system where after net casting each canoe returns to the end of the queue. Disputes are solved by fishermen themselves, and their organization probably works better than any other system proposed by fishery management authorities (Lima, 1979).

8. The relationship between traditional and scientific knowledge and the empowerment of local communities

In Brazil, traditional sea tenure and fisheries management have only recently begun to receive attention from scholars, scientists and fisheries managers. One reason why recognition of these traditional systems have been impeded is that vast areas of Brazil, notably Amazonia and the coastal zone have been treated by powerful industrial and urban elites essentially as "empty spaces" although they have long been inhabited by widely dispersed traditional communities . Traditional communities, particularly artisanal fishermen, Indians and the riverine populations have, for all intents and purposes remained "invisible" to the rest of society until recently. This "invisibility" has provided justifications and ideological underpinning for the claims of the elites to occupy, colonize and "develop" these areas where only enclaves of "uncivilized people" were supposed to reside.

This stereotypical view also extends to artisanal fishing communities. Yet, as some of these populations have started to react to encroachment by outsiders on their valuable beaches, traditional settlements and fishing habitats, we are witnessing increasing social resistance, not only to development pressures but to preservationist conservation initiatives as well. As a result, previously marginal fishing groups are becoming more socially "visible".

As in other parts of the world, Brazilian coastal waters are still considered common property with open access. With the advent of the modern fishery industry, particularly in the 1960s, "common property" and "free access" were viewed as precondition and pre-requisites for building a "modern fishing industry" (Diegues, 1983). Highly subsidized trawler fleets invaded areas traditionally used by artisanal fishermen, ignoring and disrupting existing sea tenure. Serious conflicts arose in some parts of the coastal areas, particularly of the Northeast lobster fishery. Fishery managers simply paid no attention to the traditional fishing tenure. In many instances, financial incentives, formal regulations (such as limited-entry licensing and transferable quotas) imposed by management agencies have tended to favor the expansion of new mechanized, albeit inefficient fishing industries (and consolidating the power of elites-in some regions essentially leading to the formation of a new class of "sea lords".

Moves to establish new systems of protected areas in coastal habitats are also altering and having detrimental impacts on the livelihoods of traditional fishermen. Many habitats targeted in protected areas strategies have long been used by artisanal fishing communities, whose own sophisticated resource management systems have been responsible for helping to conserve major stretches of the Brazilian coastline. Unfortunately, the first step in gazetting and establishing a national (marine) park, at least in the Brazilian context, ordinarily involves the expulsion or exclusion of local fishing populations from their ancestral land and territories. Estuaries, mangroves, lagoons and (nearshore)islands tend to be viewed as empty spaces , whereas they are actually encompassed and often elaborated subdivided and claimed by traditional fishing groups who use their own spatial "sea marks" to distinguish territories and use rights. As this paper has shown, in some cases, the spatial orientation and organization practices that still occur widely in Brazilian artisanal fishing have evolved over many generations. Recent studies (Cunha, 1989, 1992, Diegues, 1992, 1989) indicate the toll that ill-conceived conservation (including marine protected areas) schemes have taken on traditional fishing communities. While conservation interventions may appear to be benign, ostensibly constructed for the great good of nature and society as a whole, crusades to save marine environments, like uncontrolled land based "development", can be a pathway to increasing marginalization of local coastal populations.

Another common misconception underlying the lack of recognition of the value of traditional fisheries knowledge is that some government managers and some in the academic and conservation agencies as well continue to assume that "primitive societies" are unable to produce "scientific" and valuable knowledge. Government fisheries development agencies (as well as government environmental agencies) have been heavily influenced by certain natural scientists that take Western science and research on biodiversity priorities (in a strict sense) as the world's only basis for "sound marine management".

The question is: how much power, political will and capital do small-scale fishermen (and their advocates or representative organizations) have to persuade other stakeholders to listen to their voices and respect their traditions?

As Ruddle (2001) points out

> *"Local knowledge can be understood as a system of power, and thus can provide a basis for the empowerment of communities to undertake community-based resource management. This is particularly important in tropical, multi-species fisheries and their environments, for which the scientific knowledge is still relatively poor"(Ruddle, 2001: 291)*

To draw more attention to the problem of valuing and integrating traditional knowledge in marine management, govern agencies and representatives of the industrial/urban sector should consider the increasing body of evidence for legally recognizing traditional, interconnected land and sea tenure systems. If measures could be found to accord formal legal status to these systems, this could help the escalating evictions of traditional coastal communities from their beach territories – a process on a micro-scale driven by over – arching, socially and environmentally destructive urbanization patterns in Brazil. It would be, at least a small victory for artisanal communities, if means could be found to keep their villages and fishing territories from being transformed into exclusive protect areas and resorts for wealthy tourists – or perhaps of even greater importance to guarantee fishermen a voice and a more of a choice in deciding their future.

More recently in Brazil, there is a welcome, growing interest in and awareness of the importance of understanding and protecting traditional marine resource management knowledge, both inside and outside the university. A literature review of this topic conducted by NUPAUB (Center for Wetlands Conservation of the University of São Paulo) in 1999 on the traditional knowledge of biodiversity discovered that out of papers selected for review, over 35% emphasized the importance of ethno-knowledge and over 25 % of the papers in this sample address or highlight traditional management practices of artisanal fishermen. Roughly 60% of papers analysed were written between 1990 and 1999 by anthropologists and particularly by ethno-ichtyologists. It was also apparent from this study that a growing number of biologists have become interested in research on traditional knowledge systems of artisanal fishermen.

The NUPAUB study identified the following thematic areas where the knowledge of traditional fishermen could provide valuable inputs to the management of marine resources, habitats and ecosystems.

a) Stock assessment. As Ruddle (2001) points out the knowledge of fishermen can provide a useful basis for understanding local fish stocks and their population dynamics. Particularly important in this respect is indigenous knowledge concerning the timing, location and behavior of spawning aggregations of reef and lagoon fishes.(2001:289);

b) Knowledge of micro-habitats and their related species that can be use to determine location of marine reserve areas, and extractive reserves as well as specific locations for closed seasons and protected spaces for fish species reproduction;

c) Traditional management methods. As previously noted, artisanal fishermen have developed a variety of sea tenure regimes that ensure equitable access to resources and their sustainable use. Such management strategies include seasonal, spatial, gear and species restrictions as well as community-based ownership of resources;

d) Fishing methods. Artisanal fishermen know a wide range of fishing gears and techniques that are relevant to projects of fisheries sustainable development. The experience of some fishermen communities in the use of the traditional fish aggregation devices can be of great importance in projects based on Fads.(fish attractive devices)

e) ethno - ichtyology. The knowledge of local fishermen on fish classification and taxonomies using local names are relevant for stock assessment and a valuable basis for biological studies.

9 New trends and local experiences on community management.

Two interwoven trends can be identified in terms of understanding what is happening in the spheres of traditional appropriation of marine resources. Some shoreline and inshore sea tenure and knowledge traditions are disappearing under the pressure of industrial fishing, urban expansion, tourism and aquiculture projects. The cumulative effects of these modernization processes and events are seriously jeopardizing and leading to the loss of coastal / marine territories which artisanal fishermen depend upon. On the positive side, some communities are actively reviving and participating in the incorporation of traditional knowledge in modern marine frameworks. Gradually, some communities are becoming familiar with scientific research and management approaches. Often these projects are developed by NGOs or academic research institutions with little government involvement.

While coastal zone planning and management led by the Brazilian government has basically remained a technocratic exercise, confined to mapping activities, without significant in situ impacts, in some areas, coastal communities are proceeding with their own versions of coastal management. In Ceará, for instance, local communities have suffered from the invasion of their beaches by land speculators, tourism and from over fishing of lobster mainly by the industrial fleet and by divers coming from a neighboring state. Assisted by local NGO and research institutions, various fishing communities have proposed a Coastal Forum, where shared problems are discussed by representatives from a range of stakeholder groups and interests. Within this Forum, a joint management plan for lobster fishing has been proposed. When IBAMA (N Brazil's national environmental agency) announced that no funds and boats were available for surveillance of lobster fishing, local fishermen equipped one of their boats to help ensure compliance with rules regulating that fishery. Fishermen who disobey the regulations are firstly reprimanded and later, if they fail to comply with the agreed rules, they are taken to a court.

In some beach areas where there are fishing neighborhoods, the sale of o plot of land for tourists must be approved by the community council..

In some other coastal communities such as Pirajubaé in Santa Catarina, Mandira, in São Paulo and Arraial do Cabo, in Rio de Janeiro, Ponta do Corumbau-Bahia, extractivist marine reserves have being created to ensure continuing access to fisheries resources for the inhabitants

and members of the reserve and to limit outsider's access to and use of local waters, particularly for purposes of sport fishing. Most of their initiatives have a strong resource conservation component, and as result, they frequently succeed, in attracting support from Government and NGOs.

Another innovative example of the power of local initiative in establishing protected areas, where local fishermen have been actively and meaningfully engaged from the outset, through project design, monitoring and implementation is the Mamirauá Reserve for Sustainable Development in Amazonas. Mamirauá covers 1.124.000 ha and was created to protect a large part of the floodplain between the Japurá and Solimões rivers. In this huge are live 4.500 *vargeiros (inhabitants of floodplains)* dispersed in 50 small settlements, each with and average of 14 households. These communities gain their livelihood primarily from fishing, hunting and gathering of forest products.

Contrary to what is required by national parks legislation (expulsion of the population of the area), the project administrators decided to allow the *vargeiros* to remain in the territory where they have always lived. This is a region of great biological diversity, and when flooded, the water covers millions of hectares, making enforcement of legislation exclusively by government officials an impossible task. The administrative team belonging to a local non-governmental organization believed that only through community participation could the biodiversity and culture of the region be protected. Community-based-management, however, is different from the establishment and imposition of 'management plans' by scientists and bureaucrats. Community based system needs more time to develop, since their viability depends on continuous consultation and a constant dialogue with the local population, the inclusion of social scientists in the research teams and more flexibility in planning. The experience of this project demonstrates that once a decision is taken by the local population, it has a much greater chance of being followed. The advantage of this approach for conservation was in the consensus that was reached by the local population in terms of sustainable use of Amazonian lakes, which have high diversity and socio-economic values.

The communities in question decided to define different resource and territorial use categories for the lakes, including no-take zones to enhance reproduction of key species; subsistence lakes (limited for subsistence fishing; *lakes for commercial fishing* (for exclusive use of the community, where fish are to be sold); and *lakes that may be used by nearby urban centers* (where fishing is permitted to satisfy the needs of municipalities).The communities, in a democratic assembly, also decided on the types of sanctions to be applied to those community members who disobeyed restrictions.

Conclusions

In the face of and in spite of the host of threats to traditional fishing outlined in this paper, management and sea tenure practices till have an important role to play in contemporary fisheries and environmental management. Traditional structures, however, cannot be transposed mechanically into modern fishery management policies and frameworks. Natural resources management is fundamentally about regulating human behavior vis-à-vis nature and the activities of resource-users managing resources in not about regulating nature per se. Most modern fishery management centers on sustainable yield, economic efficiency and profitability considerations.

Traditional marine management has a far broader, more diverse set of objectives and functions, designed to maintain a certain way of live, local identity tied to a sense of place. Most of the regulatory measures proposed by the Brazilian Fisheries Management Authority (IBAMA) (quotas, licensing) are a mechanical transposition of those existing in Northern countries, where the ecological and social context is very different. IBAMA's agenda, in fact aims to control fishing effort within the industrial fleet, maintaining or increasing economic profitability without taking into account the social, economic and cultural contribution of small-scale fisheries to the regional economy, particularly in terms of employment and environmental conservation.

The position taken in this paper advocates and illustrates the advantages of integrating traditional marine management knowledge and sea tenure into national fishery administration. There are encouraging signs this approach is already meeting with success in some areas and that a

wider audience of fishery, conservation, environmental and public policy specialists are becoming more aware of the potential of traditional knowledge to improve marine management. Artisanal fishermen organizations are still weak, although important step forward was taken as strong social movements occurred since the beginning of the 1980's, particularly reacting against coastal pollution. These fishermen also have actively participated in providing inputs for the 1988 Constitution and succeeded in having the benefits of social security.

Changing public perception and attitudes in Brazil concerning the benefits of working to protect and strengthen artisanal fishing, local tenure systems and associated domains of environmental knowledge can to some extent be attributed to the fact that there may be substantial costs to society in the long run in failing to take action on these issues and that some coastal communities have been able to convince other stakeholder and government authorities to respect local

There is also is a growing interests among biologists and social scientists in knowing better traditional management systems. In particular, ethno-scientists have also contributed in the last two decades to the research and dissemination of the traditional fisheries knowledge and many of them can be useful tools for the management of artisanal fisheries in Brazil

Extractive reserve concepts being put to the test in Brazil, have the potential to empower fishing communities in integrating scientific and traditional management methods and in exerting greater control over their marine resources. Brazilian experiences with the extractive reserve model and in implementing site-specific projects are worthy of much more studies. Working within this framework, hopefully, more fishing communities in Brazil may yet be able to accomplish something that has elude most other traditional fishing societies in modern era, namely to require that commercial and recreational fishermen and government agencies, knowledge and respect local resource management standards, values, territorial claims and use rights..

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THE NATURES OF FISHERMEN

***Jacques Laberge*[1]**

Inflexible fidelity to fishing, hearty peals of laughter, lover of life and of a gulp of firewater (cachaça), we have chosen the old fisherman Bambão of Itapissuma (state of Pernambuco) to start these notes. He was not taken aback by the incomprehensible question about the psychology of fishermen, and answered with this enigmatic sentence: "fisherman isn't got many natures". Happy for having caused perplexity, he made us wait for the explanation: "isn't got many natures 'cause he ain't got a different nature from the farmer, the worker". On attempting to outline the profile of fishermen and specially that of the northeastern fishermen, we find they refuse to be considered a rare species. "There are the violent and the calm ones in every group of people", wisely says Luiz, Bambão's friend, and his statement could support the structuralist ideas of Levi Strauss: violence and peace, being a pain of opposites, uphold humanity.

The northeastern artisanal fisherman may feel that to ask about his psychology would be to try to frame him. Why lend themselves to other's curiosity if this brings no improvement to their lives?

Psychologists speak of feminine, masculine, child's and adolescent's psychology. Psychoanalysts are suspicious of these wide generalizations and consider it closer to the truth to point out common characteristics of several "psychic disturbances" shared by human beings:

- postponement of decisions, rituals of order and cleanliness to appease the guilt for one's own murderous desires in the case of obsessive neurosis;
- refusal of sexuality that develops into physical illness and hysteria;
- megalomania and persecutory mania in the case of paranoia;
- detachment from the world and disorganization of speech in schizophrenia;
- fetishism, sadism, masochism and homosexuality as alternatives presented by those that insist on keeping the idea that the mother also has a penis.

Psychoanalysis also speaks of oral fixations that are always present in singers and orators and when not sublimated lead to alcoholism - of strong anal fixations tinged with sadism in physicians, surgeons, teachers, dentists, bankers, clerks -- sadism being more outstanding among policemen, and among those who represent their uncontrolled and unrestrained impulses: criminals.

Would it be possible to speak of a "psychology of the fisherman" or of a group of typical psychological features?

Part of the notes that form this paper came from informal conversation with artisanal fishermen of the Northeast, and others from reports and bulletins by the Pastoral dos Pescadores, one of the only organizations to supported their struggles through the 22 years of military government in Brazil. A third source of information were texts on the fishermen of the Northeast: Lendas Vivas do Mar by Hélio Albuquerque Melo (Recife, Imprensa Oficial, 1963), and Jangada by Luís Câmara Cascudo (Rio de Janeiro, Letras e Artes, 1964).

A fourth contribution was provided by three great works of fiction: Mar Morto written in 1936 by the Brazilian author Jorge Amado (Rio de Janeiro, Record, 1982); The Old Man and the Sea by Ernest Hemingway (London, Jonathan, 1952); and the classic Moby Dick, Herman Melville's master piece published for the first time in the U.S.A. in 1851 (São Paulo, Abril Cultural, 1972).

The psychoanalytic references are taken from the Complete Works of Sigmund Freud (23 volumes) in the Standard Brazilian Edition (Imago Editora Ltda, Rio de Janeiro).

[1] Psychologist, José de Castro Foundation

Portrait and Self-Portrait

If in the beginning the northeastern fishermen tend to deny their distinctive traits, at second thought they do point out their own characteristics. Those that they mention most frequently can give us a sketch of the fisherman's social and psychological features:

- does not display the restlessness other people do.
- is always uncertain about his gains at work.
- is more individualist than the farmer, he is all eyes and at sea he will cheat his own father if needs be.
- he has no fixed schedule: the planets are his clock.
- his life is more adventurous and dangerous than others (storms, dangerous fish).
- the sun and its reflection on the water added to the salt of the water makes him grow old very soon and also causes blindness;
- he is freer and his own master while laborers are always being supervised.
- he is more artistic, smarter, puts his brains to work more than the farmer/peasant.

Fishermen insist upon stressing and explaining the advantages they have over peasants and laborers. His life is more dangerous, more exhausting. "You know you are putting out to sea but you don't know if you'll come back, like the man that goes to war, the women crying". "It's a more dangerous, heavier, more complicated life". "The fisherman is an adventurer. The farmer has a future, he has his land. The fisherman has his boat, but it is as if he hadn't. There's the SUDEPE (Superintendent for Fisheries Development), the port authorities, the storms. You hit a rock and lose your life". "If you work in the mud, there's the anequim (shark) that punctures and cripples. The mutucuta (mosquitoes) in one minute bites twenty or thirty times, clutches, tears with its teeth. There's also the muxaquim, it burns. The fellow shits through his mouth, he sheds blood through his mouth. Oyster cut our feet and our arms. When the ray doesn't manage to kill, it cripples". "The fisherman is braver, more of a hero. He faces sharks, dogfish".

This life is more dangerous and its protagonist smarter, as some of the following statements try to demonstrate: “Agriculture doesn't require too much brains. You plant, if the weather is good, everything is fine. The fisherman has to think, calculate". "The fisherman is more of an artist. He's got more experience”. “My father was the best fisherman. He could tell without seeing: Thursday there's a shoal of fish here, Sunday there's a shoal of fish there. When he was ten, he'd throw a stone and he'd know where there was fish".

Some fishermen insist very strongly upon their self-description as free men: "laborers have a boss and a foreman watching. Fishermen, nobody watches them". "Those who fish on other men's boats are laborers". "Fishermen haven't got spies and laborers have got spies. Only God spies on fishermen. The owners of the mill say to their workers: "I'll pay a hundred thousand to the lawyer but you'll only get five hundred". "I quit the police, I quit cooking, I quit collecting bus fares, I quit the restaurant were I was waiter, I’m very happy to be free, an individual; nobody watches me".

Brave as a war hero, freer than the laborer, the policeman, the cook, the collector, the waiter, owning more brains and more art than the farmer, the fisherman is the best. In other words, the representations formed by the sea, waters and fish as a threat and a danger, as a mystery to be revealed as the art is to the artist, has a purpose: to demonstrate how worthy the fisherman is, how interesting is his work. The more dangerous, the more interesting it becomes. The vicinity of danger, the very threat to his life is something the fisherman usually associates to his trade. If according to Socrates the strongest desire is that of dying, then those who are closer to death because of their trade could be considered curiously privileged beings.

To compare the fisherman's self-portrait with the portrait made by others can prove suggestive at this moment. Armandino Reis (capataz da Capitania dos Portos), said about the fishermen of Goiana, in the state of Pernambuco: "the river has always been polluted. They don't want to study. We have MOBRAL (Night school for adults - "Brazilian Movement against Illiteracy"), but they won't go. If they don't want to learn, they should move on to somewhere else, because Goiana isn't the only place where there is fish in the water. But these people are like that. Many of them don't even know Recife. Their life is going from home to the river and back"

(published in the newspaper "O Globo" in Dec, 24, 1978). This opinion shows quite well what goes in the mind of a representative of the dominant class, and is a typical example of class prejudice.

Another point of view is that of the Pastoral dos Pescadores, that admits its dominating mentality (see reports of the Assembly held from April 1st to 4th, 1978), thus revealing its capacity for self-criticism. In its reports on contacts with fishermen the Pastoral stresses the following features: fatalism and indolence, mistrust and disillusion, alcoholism, individualism, doubtful freedom, persistence in working.

"Along all the beaches of our vast coastline", states the bulletin O LEME of June, 1977," we see devaluation, disillusion, resignation, exploitation". Therefore, the Pastoral wants to "awaken the value of the human being", "put the fisherman back on his feet", "make him a person again: responsible and free from fear". If it is true that its aim shows a tendency towards domination, it is also based on a denunciation of the conditions of marginalization and oppression that has mutilated the fishermen. These reports also insist that all governmental programs related to fishing should be reconsidered taking into consideration the fishermen's own knowledge, experience and interests, thus making them agents of their own development.

This difference between their self-portrait and the portrait made by others is very meaningful. It is also inevitable as narcissism encourages self-exaltation and rivalry, provoking depreciation of others. Anyhow, self-opinion is different from someone else's opinion, both revealing their own subjectivity. Furthermore, self-opinion is different also from self-expression. One sees some things and not others and this "sight" is constantly deluding one, for the human being is not transparent, his psyche even less. Truth ends up hiding, escaping and, in fact, remains mostly unconscious. As for self-expression it is usually marked by an advertising connotation as if to draw our attention to the irresistible qualities of a product, whose side effects are obviously not mentioned. It is true that this advertising speech reaches its limits at moments of crises and becomes hollow - the hour of truth arrives. The bubble created by narcissism and the struggle for prestige simply bursts. On the other hand, it is not always easy to judge about narcissism as it presents itself in every human being; is the object of love that which the person is, or was, or would like to be? (See Introduction to Narcissism by Freud) Does the fisherman talk about what he is? Or what he once was? Or what he would like to be? One must also have the importance of narcissism as a defensive weapon against external aggression and depreciation in mind. If due to a narcissistic reaction fishermen find reasons for praising a freer, more dangerous and cleverer trade, they also stress a characteristic that some may question but that is considered by many as their most distinctive feature: "none of that restlessness". Compared to all the other people that must live in a hurry, in the midst of noise, confusion and traffic they display an opposite way of being completely removed from the turmoil.

In his book Jangada (Raft), Câmara Cascudo makes an important remark on this matter and describes fishing as a "profession of silence": "the raft fisherman must be silent in midst of the savage musicality of the sea. He is the only worker who cannot talk or sing during his tasks" (p. 18). "The sound of the human voice scares the fish away" (p.19). The fisherman reflects the silence of the waters. Nevertheless, besides the demands of the trade a silent complicity pervades the fisherman's being and the hushed murmur of the waters.

In the beginning of Moby Dick, Melville speaks of the sea as a remedy for aggression, "for pistol and ball", even when this pistol is pointed against the protagonist himself in the form of hypochondria and a wish to die.

Rain and water, sun and water, night and water. Fish may disappear, the nets may tear but this direct contact with nature, sun, rain, night and water will never be lacking. Water, always water. What influence do ten, twenty, thirty, forty years of implacable sultry sun, of silent nights, of constant contact with this mysterious water that provides survival have over a man? For nervous agitated people one prescribes a tranquilizing remedy: the waters, the sea. The combination of sun and water produces relaxation, repose and after some hours a pleasant heaviness. What would happen after years and years of this treatment with overdoses? And what of the rhythmic rolling of the boat and it's soporific effects? These are more than enough to cause this lack of restlessness that outsiders call indolence or even passivity or laziness. A remedy for nervousness, for lack of control,

for aggressiveness, and when the latter misses its target, the waters pacify, soften. This is why the rivals of this class conclude that fishermen are lazy while fishermen see the same facts and come to the conclusion that they are "much calmer," a characteristic that makes him different and superior to everybody else.

Calmness, silence and lack of restlessness makes him different and sets him apart from other human beings. Identification with the silence of the waters makes him withdrawn when he's back on dry land. Augusto, a fisherman from Pina, Recife, says: "fisherman are suspicious, like Indians. That's why it's so difficult to make the first contacts. He is different because the sea, the time schedule, the kind of work, drive him away from people".

This aloofness, stemming from a distinctive lack of restlessness, surpasses the understanding of behavior. In fact the waters are not only waters -- both the waters and their inhabitants are pervaded by constant and complex symbolism and personifications.

Some Symbolism

Several traditions of myths and legends, stories and poems transmit the symbolism of the waters.

The Afro-Brazilian tradition contributes with its own interpretation. Jorge Amado's Mar Morto, a book about fishermen's lives reminds us that "the man of the dry land seldom understands the heart of sailors" (p. 9) who are born and die at sea. The title, Mar Morto, links sea and death, a theme that is present in the beginning of the book, following the narrative up to the end with the "storm that sank ships and killed men" (p. 13). "Yemanjá is the mother of water", "she owns the sea" "and this is why all men who live on the waves fear and love her." "To see the mother of water many have already plunged into the water smiling, never to be seen again. Does she sleep with all of them in the bottom of the ocean?" (p. 21). "Yemanjá is like this because she is mother and wife. Those waters were born from her the day her son possessed her" (p. 71). Jorge Amado reminds us that Yemanjá had a child by Aganju, god of the dry land: Orunga, god of the air. "Orungas thoughts could not escape from the image of his mother, that beautiful queen of the waters. She was the most beautiful of all and his desires were all for her. Finally he could not resist any longer and raped her. Yemanjá fled and while fleeing her breasts tore open and thence flew the waters and also the Bahia de Todos os Santos. And from her womb fertilized by her son was born the most feared Orixás, those that send lightning, storms and thunder. Thus, Yemanjá is mother and wife. She loves the seamen as a mother while they live and suffer. But on their dying day it is as if they were her son Orunga, full of desire, wanting her body" (7).

The myth of Yemanjá emphasizes the personification of water as a feared and beloved mother. The waters themselves result from this incestuous relationship when the son no longer resists the charms of his mother's beauty. It is interesting to note that Guma, the hero of Mar Morto, when meeting his forgotten and unknown mother wants her as a woman. Not recognizing his mother, he takes her for one of the whores of the wharf. This is the context that lends full value to the chorus of Dorival Caymi's song: "the fisherman has two loves, one on land, one at sea".

What kind of mother does the water suggest? Actually, each individual fisherman is free to project onto the waters fantasies and images according to his own singularities and experience. A phallic mother, dominating, that imposes her own will no matter what; an anal mother, always at her post, imposing order and cleanliness; an oral mother, kind, nurturing, feeding them with the products of the sea.

The symbolism of legends, myths, folklore and dreams reveals another aspect of the mother. The sea highlights the mother of pregnancy and childbirth. Like the sea the mother keeps within the "waters" of her womb a precious treasure. She lets it fall onto the beach of life, and her son is born. Fantasies and dreams about water and fish refer to pregnancy, to the womb, to delivery. In his "Dreams and Telepathy", Freud reminds us that the waves of the sea, its violent to and fro, symbolizes the intermittent pains of childbirth as the act of saving someone from the waters stands for birth. The daughter of the pharaoh takes Moses from the basket on the river, thus revealing herself as his mother, a special type of choice of object. When Akki collects (also from a basket on the river) the newborn Sargão who will become the founder of Babylon, he also declares himself a

father. Freud states in his "Moses and Monotheism" that the basket is the uterus and the water the amniotic fluid. This symbolism, even if unconsciously (since the fisherman does not know it), pervades and supports his everyday life. Even when denied our unconscious desires, motivations and fantasies completely determine human actions and ways of being.

When we are aware of this mother of waters, pregnancy and childbirth, two of the fisherman's characteristics gain new meaning: silence and individualism/rivalry. The fishermen are not silent only to avoid sharing the fish but also due to their intimacy with the mother - water that understands through silent empathy. This silent communication revives and reminds one of the bodily harmony with the mother, the harmony without words of uterine life.

This symbolism is universal and does not belong exclusively to fishermen. Constant contact with the waters highlights these symbols for him and make him a privileged man. He is in daily confrontation with other fishermen, though each man's history and experiences makes him different from his fellow men.

In terms of individualism/rivalry, any child will teach us that the simple fact of belonging to some other child makes any toy desirable and worth fighting for. Possession of that object does not necessarily solve the problem: one desires whatever object belongs to another person. Fishermen acknowledge their excessive individualism and rivalry. Few trades provide so much direct contact with the mother represented by the waters and this daily intimacy with the water-mother would lead the fishermen to consider her exclusively his and shun the proximity of any rival. While struggling to maintain his position near the mother he sometimes identifies himself with fish, in other moments seeing them as rivals. When identified with fish he tries to take them from the bowels of the ocean. In other words, the exacerbation of the fisherman's rivalry would be an anticipation. The importance of the symbols uterus, pregnancy and delivery, all unconsciously present, would aggravate the rivalry felt by the child that sees his mother's bulky abdomen and feels threatened by the coming of his younger brother.

FISH-BROTHER

The brother-fish is one of Hemingway's main themes. His book "The old man and the Sea" tells the story of Santiago, a persistent and resolute fisherman who spent 84 days without catching one single fish. After the first forty fruitless days his helper, a little boy, is called back by his parents who wish to see him on a luckier boat. Everything on that fisherman was old except his eyes, the color of the sea, never defeated. This quality of persistence is also pointed out by northeastern Brazilian fishermen.

A persistence even more noteworthy than that of Hemingway's story, representing fishermen in general, it is a story of loss. The old man grieves the loss of the boy uttering a sorrowful refrain: if only the boy were there! The lack of the boy follows from the very lack of fish. Back from his exhausting trip, his trophy illustrates his very loss.

Santiago's ideal is Joe DiMaggio and he dreams of a baseball championship for his team, the New York Yankees. When he accomplishes great feats while fishing, he dreams of deserving the admiration of Joe DiMaggio, whose father was supposedly a poor fisherman.

The sea is not the protagonist of this story. Fisherman and fish are the main characters. Even if young fishermen talk of the sea as an enemy they speak of it as something feminine, for the sea is affected by the moon, like women.

One day Santiago catches such a big fish that it drags his boat out to the open sea. Fish and fisherman fight for their lives, a battle of persistence tinged by love, admiration and respect for the fish that is identified with a brother, as can be seen by his reflections:

> *Fish, I love and respect you very much; the fish are not as intelligent as we who kill them, but they are nobler and more capable. The fish is my brother too, but I have to kill it. Fortunately I do not need to kill the sun, the moon and the stars also. It's enough to have to live at sea and kill our true brothers; Fish, you must die anyhow. Do you also have to kill me? You are killing me, fish... I had never seen a bigger, calmer, nobler thing than you, my brother. Come and kill me. I don't mind who kills whom; and then, the living fishing came with all his death within, and surged from the water showing all his width, and all his length, all his power, and all his beauty; I am a weary man. But I killed the fish that is my brother; with his mouth closed and his tail stiffly undulating, we sailed like brothers.*

With the death of this brother-fish comes guilt: it may have been a sin to kill the fish. He loved the fish when he was alive and still loves him. If he loves the fish it is not a sin to kill it. Or is it a yet greater sin?

For such a sin he receives the due punishment. Defeated by the sharks that devour the fish, Santiago arrives at the beach trawling a carcass. The desolate fisherman concludes he has ruined both himself and the fish. Loss is the only trophy of this tiresome trip. The Old Man and the Sea is the very metaphor of loss. The lack of fish of the first eighty days which marks the beginning of the story are answered in the end by a wonderful, illusory gain that transforms itself into a dramatic loss. Nothing in the beginning, nothing in the end. When the tiresome journey of life ends, only the carcass is left. One can only own things in the realm of fantasy. As defeated as his brother fish, Santiago goes home dreaming of lions. If one cannot fish in reality one can at least hunt in dreams.

But why capture, defeat, and kill the brother? To eliminate our rival and possess our mother.

MOTHER-WOMAN

The myth of Yemanjá reported by Jorge Amado stresses the fact that she is her son's mother and also his wife. The sea waters sprang from her breast on the day of the incest. More beautiful than any other woman she attracts all of her son's desires. Thus she is the mother of the fishermen who still live and their wife when they die, in an association of incest and death.

The myth of Yemanjá revives the universal myth of incest, of the mother as first object of love. If it is true that psychoanalysis formalized the Oedipus complex, this was only possible because it had been previously created in Greek tragedy. Sophocles is the one who tells us how Oedipus, unaware, kills his father and ends up marrying his own mother. Otto Rank reminds us of how literature, drama and poetry of all times have focused on incest under its varied forms and disguises. Long before Freud, Diderot wrote in his novel The Nephew of Rameau (1762) "If the good savage was left to himself, kept all his insanity and added to the limited awareness of a baby the violent passions of a 30 - year old man, he would strangle his father and sleep with his mother".

How many are the ways by which the universal myth of incest finds expression! - Explicit or veiled dreams of sexual intercourse with the mother, choice of objects of love with maternal characteristics, impotence related to incestuous fixations, phobias representing paternal rape. This revelation of the Oedipus complex as a psychic structuring element present in every human being was, according to Freud, "received with general disbelief by adults and normal people" because it "offended the most sacred human sentiments", the rejection of the myth being "an aversion felt by human beings for their primitive incestuous desires, now controlled by repression". The standard Brazilian Edition of the complete works of Freud includes the following references: Totem and Taboo (XIII, 36 and 156); Leonardo da Vinci (XI, 92); A Special Kind of Choice of Object (XI, 152); On the Universal Tendency to Depreciation in the Realm of Love (XI, 164); Introductory Conferences (XV, 249, 394); An Autobiographic Study (XX, 50); The Lay Analysis Issue (XX, 243).

For Jorge Amado's fisherman the Mother-Woman connection is direct. Yemanjá, mother of waters, is the most attractive of women. She is the mother of Guma, to his eyes the most sensual of women.

Putting out to sea is a task for the male fisherman. The female only gathers shellfish, in other words, she looks for oysters and crabs in the mangrove forests. Penetrating the waters, fishermen become rivals. They face all dangers in order to come to this idealized meeting with the waters from which they will collect the best and largest fruits. The famous unbelievable stories about the biggest fish ever seen illustrate the illusion of being the greatest. This is a phallic, narcissistic satisfaction derived from an object obtained from an intimate contact with the mother - woman - waters, of whom the fisherman is a privileged companion. The incestuous fantasy that permeates and does not mark human beings finds in the fisherman's life a vast field for constant renewal and sublimation, rocking with the tranquility, the roaring, the agitation of the waves.

DEADLY ASPECT

The myth of Yemanjá highlights something which psychoanalysis also reminds us of: the deadly aspect of incest. Yemanjá is mother in the life of the fishermen but she is their wife in death. Incest is deadly because it does not lead to life, to the future. It leads back to the past, associated with possessing the mother and not to the process of gaining independence from her. To live only from the past, or in other words, only from the mother is equivalent to not believing in life. "In old times" things weren't like this, say the old ones. In the past, when we had our mother, everything was much better.

If the mark of death permeates all human beings according to the Freudian classification of life impulse and death impulse, a particular expression of this division would exist in the incestuous/deadly relationship as it hinders the search for other relationships. If the mother is perpetually present there is no need to call out for her and even less need for calling out for other people. The silence of the fisherman represents something of the kind. This doesn't mean he is more incestuous than other human beings, it means only that his intimacy with the mother-water represents this presence that dispenses with words.

The impression of being the best is not based simply on his kind of work, on his greater cleverness or on the type of courage needed for facing storms and fish but also on this complicity with the mother-water for it is always in her eyes that he is the best, always in contact with her that he proves his courage, cleverness, freedom. The mother-water is the first and foremost witness of his superiority among other rival brothers represented by the fish that are "hunted" and defeated. If the fisherman is closer than all the other men to the mother-water he is the one who must compete, the most individualist. He is the one she prefers. He knows it and makes it known to others. If he keeps other people at bay, it is because he lives and wants to live even closer to her. Movements, relationships and noises seem to him devoid of interest and insipid when compared to this unique irreplaceable contact with the mother-woman-water-nature.

The impression of being the best would then be fundamentally connected to this singular closeness - communication with the mother-water and with the risk of dying that she represents. Jorge Amado establishes an intimate connection between sea and death, starting from the title of his novel "Dead Sea" and shows how the fate of the oarsman is to upset his canoe in the sea; a sea that kills and a fate that his hero, Guma, obeys blindly impelled by his incestuous desires.

Melville's novel Moby Dick places a particularly strong emphasis on this deadly aspect of the sea. The story is about a white sperm-whale that embodies all the subtle demons of life and thought, all the evil. It overturned boats and once completely destroyed and sank a large ship with obvious premeditation. It represents to perfection the sea that has indiscriminately taken dozens, hundreds, thousands of beings from their boats and which will go on killing to the end of time. Captain Ahab spends forty years of his life searching for this murderous monster who had cut off his leg. Swearing revenge and violence he faces the greatest dangers in order to hunt down the beast. The furious pursuit of the great gliding devil of the seas of life, of unusual size and viciousness and with an insatiable thirst of human blood, finally recreates Ahab in the image of his prey: he is more a demon than a man.

The beast represents the ocean itself, this perpetually unknown territory. The sea is not only a fearful enemy of man but also a devil to its own offspring, even worst than the Persian host who killed his guests. This is the nature of the sea whose most feared creatures move under the surface, usually invisible, treacherously hidden under the most enchanting shades of blue. Just as this dreadful ocean surrounds the verdant land, in the soul of man lies an insular Tahiti, full of peace and happiness, but surrounded by all the horrors of the God-forsaken semi conscious existence. Contemplating the calm beauty and magnificence of the ocean's surface, one forgets the tiger's heart that beats below. The author associates "dreams and sea", "meditation and water" from the beginning, saying also that all roving ends up at the sea, and reminding us of how Narcissus drowned in it. The starting point of this whale-hunting expedition is the Peter Coffin shipyard. In fact the ship's carpenter lived making coffins.

It is only in the seventh and last part of this massive novel that the murderous monster appears. Ahab seems then to have relentlessly pursued his enemy into an oceanic refuge in order to kill him more safely there, but by the end of three days of battle Moby Dick sinks ship and crew,

leaving Ismael, the only survivor, to tell the tale. In the end all is swallowed up and the great watery shroud goes on undulating just as it had been doing for five thousand years.

With this fish story Melville contests the Yankee Puritanism and the gullible Victorian optimism by showing the "victory of evil" that takes man from the center of things and replaces him by mysterious and treacherous forces of the sea. This displacement heralds the coming of Freud, who by discovering the unconscious displaces the ego from its supposedly central position within the human psychic realm.

We do not know if the sea is more evil than the sperm-whale. We know only that the monster stands for that treacherous and deadly sea.

The sperm-whale inspires admiration. The fragmentation of its huge body dissected by the author's thorough analysis is accompanied by praise: the ambergris is used in perfumery; the oil and its efficiency in cleaning; the wonderful cistern in the vast head; the marvel of the jaw free from joints; the miracle of the symmetrical tail. Jaws, ribs and vertebrae complete his admiration while painstaking comparative study of two heads (sperm-whale and whale) allows a renewed literary exaltation. To deify the family of these animals is the only thing missing. The sect of the Shakers is left in charge of this task and they transform the sperm-whale in an incarnate God. In fact, it is almost eternal as an immortal God having swam the seas long before continents were created, gliding over the places where now stand Windsor Castle and the Kremlin.

But the best reason for admiring the sperm-whale is its power. Its omnipotence inspires at the same time admiration and hate since its greatness and beauty are only matched by its cruelty, its incredible ferocity, insatiable thirst for human blood and the diabolical indifference with which Moby Dick attacks his human enemies. He is the white devil eliminating all rivals in order to continue to be the only owner of the sea as the arbitrary primal father, owner of the mother and of all other women. It is meaningful that Melville should call him "that old great-grandfather", a very adequate nickname for this type of primal father that threatens with death and castration those who want to lay hold of the sea. But its own arbitrariness produces in others the desire to kill it, and thus Ahab spends his life dreaming of killing the beast: three punctures in that pagan skin and the morsels of the white whale were seasoned. And in his dream his thundering scream would echo through the vaulted hull: "Abaft! The whale spouts thick blood!".

Melville seems to disclose the danger of death that is always present in the fishing life, and which the fishermen's stories and speech illustrate. The fisherman imagines he owns the sea but the sea is stronger than he is and it already has an owner. And the owner threatens with death those who try to take possession of the sea, of the mother. To dare to establish an incestuous relationship is to ask for immediate vengeance of the great-grandfather. The first time Ahab wanted to be the owner of the sea Moby Dick took his leg. The second time he was dragged to the bottom of the sea. He dared and he died for it.

MOTHER-FATHER-BROTHER

For Jorge Amado the incestuous relationship itself is deadly because it represents the dual, almost symbiotic relationship between sea and fishermen, mother and son. The novel is dominated by the image of the mother-wife-sea. There we do not find a forbidding father interposing himself between mother and son. And this is evidenced by the fact that Guma, the hero of Mar Morto, does not have a father. He only has a mother, the most attractive women.

Melville describes the deadly aggression of the sea because his main character is not Jorge Amado's sea-mother but the murderous monster, the diabolic great-grandfather who actually represents the father. In Moby Dick death is not a consequence of a symbiotic relationship between sea and fishermen, mother and son but a consequence of the very deadliness of symbiosis. Death is caused by this third element interposed between sea and fishermen, mother and son. The sea is so aggressive because it is fundamentally a bearer of this demon that rejects anyone who wants to possess the sea. The sperm-whale, this primal father, simply eliminates its rivals.

In other words, Melville describes a real, cruel death. Because the whole novel concentrates on the whale, Melville is led to stress mainly the image of a sort of forbidding father and

consequently to stress the symbolic death that represents the prohibition of incest, the separation between mother and son, sea and fishermen.

Hemingway lays stress on another perspective, that of the sea as the hiding place of our brother fish.

The speech of fishermen is again different from these viewpoints because in this case the sea and the waters are used to highlight the fishermen's own narcissism.

All present the sea as a region of loss, of absence. Drastic loss, risk of death, separation, lack of fish. Ahab and Guma, Santiago, and the artisanal fisherman are all confronted with loss, with absence. The trade of the fisherman is so special precisely because the risk of death grows when the fish are absent. The lack of fish for 80 days forces Santiago to undertake a risky adventure. The lack of fish leads Guma to attempt in vain to master the storms. The absence of sperm-whale drives Ahab to pursue it until complete exhaustion. The lack of fish is what takes up most of the talk of the artisanal fishermen of the Northeast. They want to find the cause: whether strong winds, torrential rains or pollution. And this absence ends up revealing itself as the very force that drives their process of gaining subjective value.

THE DANGER OF THE SEA IN SOUTHERN BRAZIL AND THE EX-VOTOS IN THE CHURCH OF BOM JESUS IN IGUAPE - SÃO PAULO

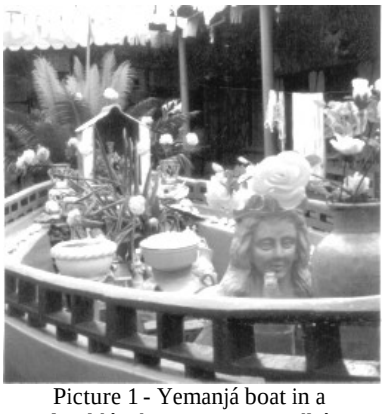
Antonio Carlos Diegues[1]

Introduction

The votive offerings are an important part of the traditional religious symbols and practices in many Brazilian Atlantic coastal regions and frequently are exposed publicly in those churches that are holy places for pilgrimages.

The ex-votos can be defined as objects or religious practices dedicated to a saint in fulfillment of a vow or in retribution of a received favor.

Although the ex-votos are object of study in the folklore since the Thirties in Brazil, the maritime ex-votos have been only marginally studied in our country. Most of the first references on maritime votive offerings appeared only in the Seventies in the books of folklore researches such as Câmara Cascudo (1971) who indicates the presence of maritime ex-votos in the famous procession of Holy Mother of Nazaré, in Belém. Jorge Amado, in his book The Todos os Santos Bay (1970) describes the work of those artisans who paint the marine votive offerings (riscadores de milagres) that are exposed in popular churches such as Nosso Senhor do Bonfim and Nossa Senhora das Candeias, in Salvador, Bahia.



Picture 1 - Yemanjá boat in a candomblé religious centre in Ilhéus - Bahia

This paper aims at studying the maritime ex-votos found in the Church of Bom Jesus de Iguape, a small coastal town of southern São Paulo as symbols of religiosity of the coastal communities of southern Brazil. Iguape is a catholic worship center that attracts hundreds of thousands of pilgrims, particularly during the first week of August, when the feast of Our Lord is celebrated. These pilgrimers come mainly from the States of Santa Catarina, Paraná and Rio Grande do Sul and some of them lay in front of the holy image their votive offerings.

The dangers of the sea and the religious feelings of coastal communities in Brazil.

The main religion of the Brazil coastal communities is Catholic, although in many regions that is a mixture with Afro-Brazilian beliefs to which different spirits (orixás) are related to the sea and its danger.

Yemanjá is the most known goddess of the sea to whom the worshippers offer flowers and parfumes, throwing these gifts in the sea during the festival of february 2. Yemanjá is the goddess that protect fishermen from storms and dangers at the sea.

Most of the communities in southern Brazil are Catholics as result of the Portuguese colonization, and particularly by the influence of the migrants from Azores that are zealous Catholic.

Important manifestations of the religious feelings and behaviors in those regions are linked to the sea, as for many centuries, since the discovery of the country in the XVI century this area was

[1] Anthropologist, Professor at the University of São Paulo

very isolated from the capital sharing borders with the countries colonized by the Spanish. The only means of communication until the beginning of the XX century were maritime. It should also be said the Southern Atlantic is particularly changeable and dangerous for navigation during the winter months.

The Atlantic Sea was feared by seamen at the age of the Great Navigation as the dwelling of monsters and an ocean known for its storms that caused frequent shipwrecks.

The French traveler, Jean de Lery (1954) that visited Brazil in the middle of the XVI Century was impressed by the violence of the storms that threatened his ship. The Catholic seamen of his boat used to ask for the protection of Saint Nicolas and to throw overboard images of this saint to calm storms.

The Portuguese caravels were blessed by the priests before leaving Lisbon to Brazil and saints were invoked by seamen to protect them against frequent shipwreck.

During the first three centuries of the Brazilian colonization, the Portuguese were afraid not only of storms but also of pirates and buccaneers that attacked their ships along the Brazilian coast and hid their boats in the isolated islands along the coast.

Piracy was an important and profitable activity from the late XVI to the beginning of the XIX century. In the middle of the XVII century when the image of Lord Jesus of Iguape was found on the beach of Iguape, there are many references to the presence of English and French pirates along the São Paulo coast. In 1655, for instance, the King of Portugal sent a letter the Governor of São Paulo, giving orders to reinforce the defenses of the harbor of Santos, assuring the safety of the ships. In 1722, the authorities of the coastal city of Iguape asked the Governor for military reinforcement as pirates were seen nearby. The assaults of the pirates were so frequent that the King of Portugal ordered that the merchant ships œuld only travel to Portugal in convoys, protected by military ships. (Almeida, P, 1946)

Maritime ex-votos in Brazil

According to Mollat (1983), due to a great fear, at the end of the first millennium many Christians walked on the roads of Europe carrying ex-votos to sanctuaries. From the XIV onwards the votive offerings increased in number in Europe and during the period of the great navigation, in the XVI century the number of ex-votos increased in number due to the fears of the unknown continents and the dangers of the Atlantic Ocean.

In fact, there are references of ex-votos in Portugal from the XV onwards and in the convent of Santa Maria das Virtudes, there is a description of marine votive offerings in 1453 (Museu da Marinha, 1983: 584)

It is difficult to assess when the first ex-voto was offered in Brazil, but one can guess that due to the fact that the country was under Portuguese influence, the votive offerings due to navigation events in Brazil were taken to the mother churches in the metropolis.

Picture 2

The religious centers of pilgrimage born from the waters

It is surprising that most of the important sanctuaries for religious pilgrimages were born from events related to the waters. The image of Our Lady of Aparecida, protectrix of Brazil was taken from the river by local fishermen. Our Lady of Nazaré, now in Belém, is also an important religious center of pilgrimage linked to the sea as the statue was found by a fishermen close coastal fishing village, Vigia, in the XVII Century. The procession dedicated to Our Lady of Nazaré, in October, is the greatest in Brazil, congregating more than 1 million people in the streets of Belém. During the procession there many ex-votos being carried by pilgrims, particularly miniatures of boats.

The image of Our Lord Iguape, the most important pilgrimage of Southern Brazil was also taken from the sea in 1647. Its discovery by three Indians in the beach of Juréia is marked by miraculous event, described in the historical document of 1785 (Livro do Tombo) from Iguape: a Portuguese ship was carrying the image of Our Lord from Portugal to Pernambuco when was attacked by protestant pirates. To avoid the capture of the religious statue by the pirates the seamen slided it into the sea water in a raft lightened by six candles. The marine currents have taken the raft from the north to the south, and the legend says that when the floating raft passed near Ilha Bela, the bells of the church rang miraculously during the night. Some two hundred miles the raft reached the coast of Juréia, where the statue was found by Indians and taken to the city of Iguape, one of the oldest centers of Brazil. (Picture 2)

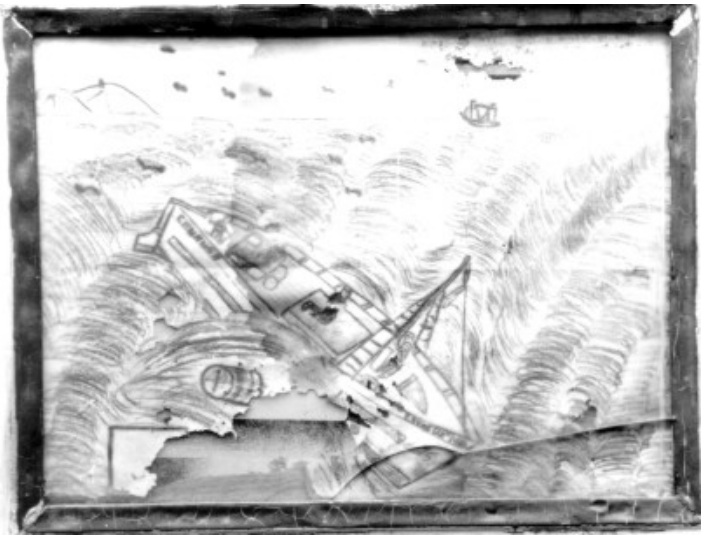
In the middle of the XVIII century there are indications that the miraculous statue attracted pilgrims from southern Brazil, and a new large church was built in the beginning of the XIX century to receive the growing number of pilgrims that arrived in Iguape to thank Our Lord for a favor or a miracle.

The linkages between the city and the sea and river are important to explain the whole history of the town. Iguape is located at the mouth of one of the most important rivers of southern Brazil: the Ribeira de Iguape, through which the first gold exploring expeditions started in the first years of colonization in the XVI century. The city became an important center for gold export till the XVIII century, when larger amounts of gold were found in Minas Gerais. Iguape itself was one of the most important harbor of southern Brazil, exporting different goods, such as rice until the end of the XIX century. Many ships left from Iguape to Rio de Janeiro, Montevideo and Portugal and the sea was maritime navigation was essential.

In the beginning of the XIX century a canal was built linking the river harbor to the estuary where the harbor was located. Subsequently, the sediment transported by the river filled up the main sea bar (entrance), hindering the entrance of larger ships. The decreasing important of the navigation was one of the causes of the impoverishment of the town in the beginning of the XX Century.

The veneration of Our Lord of Iguape, initially of local importance, was strengthened by the pilgrimage of the Azorean migrants that settled in the southern provinces of Santa Catarina and Rio Grande do Sul in the XVIII century.

França (1972) notes that the devotion to Our Lord was strong among the fishermen of Azores. She also that the veneration of Our Lord existed in southern Brazil before the massive migration of Azorean to Santa Catarina State in the middle of XVIII Century, although it is also known that small groups of Azoreans have participated in the colonization of the southern region before the State organized migration One reason might be the fact that people from Iguape have participated in the colonization of the southern part of Brazil in the XVII Century, when priest and missionaries might have expanded de religious devotion among settlers in Santa Catarina.



Picture 3

Until today a significant part of pilgrims that come to the religious feast of Our Lord of Iguape in early August is formed by Azorean descendants that until the beginning of the XX Century came by sailing and later on steam boats taking with them the voting offerings. The maritime travel was hard and used to take several weeks to reach Iguape. It should be said that the Azorean descendants became skilful seafarers and fishermen by the end of the XIX Century when

they gradually abandoned complementary activities such as subsistence agriculture and became full time fishermen.

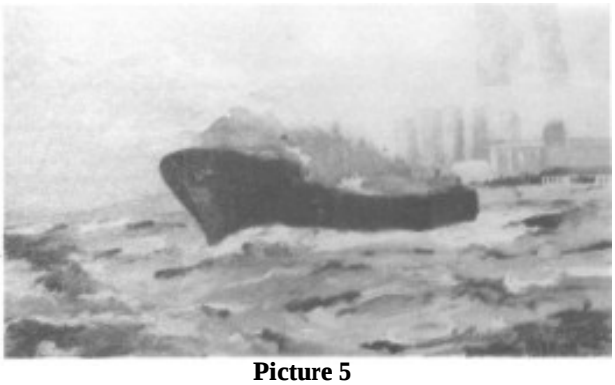
Votive paintings were frequent until the 70's when they were totally replaced by photos and other forms of ex-votos. At the same time, traveling by sea almost disappeared, and good roads were built linking Santa Catarina to São Paulo and the sea entrances in the Iguape-Cananéia estuary became too dangerous for coastal navigation.

The pilgrimages also occurred in August, after the fisheries of mullets that was an important economic activity in Santa Catarina from which the pilgrims got cash to spend in the traveling and also in the market that is organized during the August festival.

The maritime ex-votos in the Church of Iguape

Picture 4

The ex-votos of the Church of Iguape are placed in a large room, in which all the large walls are covered with paintings, photos, miniatures and representations of parts of human bodies in wax, indicating the various situations in which the divine intervention was asked for, the danger was removed and difficulties were smoothed. The majority of the votive offerings refers to healing of illness .Among the maritime ex-votos, there are eight votive paintings and a dozen of miniatures of boats displayed in a wall cabinets. Some of them are damaged by termites and humidity. All the painted votive offerings are from the 30's to the 70's and it is cleared that they represent a small proportion of maritime ex-votos offered by pilgrims during the last three centuries, as from time to time, the Church authorities would discard some of them to be replaced by new offerings. In recent years, these authorities have mentioned that some old marine painted ex-votos were stolen by robbers.



Picture 5

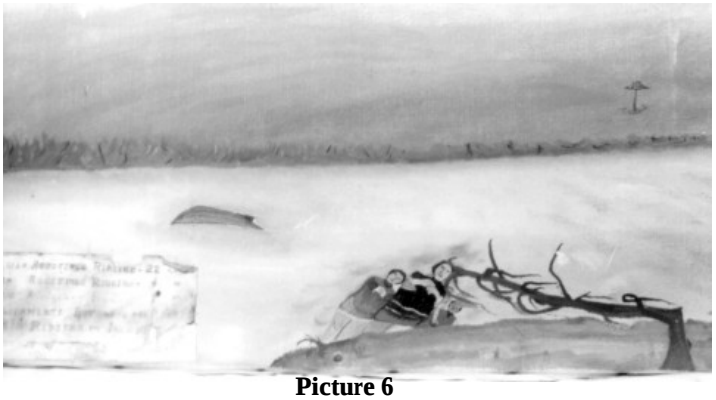
Shipwreck and dangers of the sea are the main topics of the painted votive offerings. The intervention of Our Lord of Iguape was urged when there was a danger in the sea, usually storms and fires that were threatening the ship and the lives of the sailors and passengers.

According to different historical narratives and accounts shipwrecks and losses of vessels and crews were frequent in the southern region in the early century of the Brazilian colonization. This coast was under dispute by Portuguese and Spanish until the early XIX Century and sea battles and skirmishes were not uncommon. At the same time, the sea bordering the southern coast is known to be unpredictable, with rapid changes of weather and storms. It was also mentioned that the Azorean migrants, in the beginning of the colonization were mainly small-scale farmers that gradually moved into fishing, becoming the best deep sea fishermen in the whole country. In this process, Azorean descendants were forced to face the dangers of that unpredictable sea.

The first narrative known of a shipwreck and the urge for intervention of Our Lord of Iguape occurred in 1714, in front of the entrance of the estuary, one of the most dangerous part of that sea. (Paulino, A 1946)

Dangers of shipwreck in the various sea entrances of the area and the intervention of our Lord of Iguape are represented in various votive offerings. The first picture (picture n.3) represents the dangers that threaten a fishing boat at the entrance of Cananéia. One of the crewmember is kneeled in the center of the boat, asking for protection of the saint.

The votive offering n. 4 represents a shipwreck that occurred in another sandbar in front of Paranaguá city. The painting is done with pencil and is in damaged by the action of sunlight and humidity. It shows the desperate situation of fishermen after the ship suffered shipwreck. In the button of the painting the seamen urge the intervention of the saint who is represented in the upper part of the votive offering. This ex-voto was offered in 1967



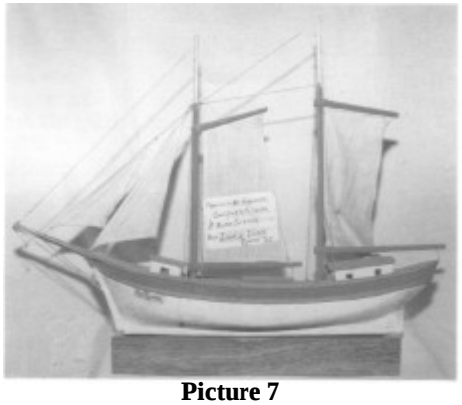
Picture 6

The picture n.5 shows a large ship in fire in front of a harbor that seems to be that of Paranaguá, in southern Brazil and was offered in 1961

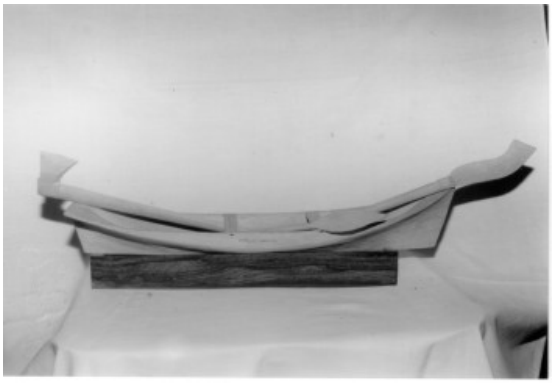
The only painted votive offering that represents the danger of a river flooding shows a mother and the children being saved by a branch after the canoe went wrecked in the Ribeira River, the most important river of southern Brazil, where many dangerous flooding still occur. (picture n.6).

Among the various ship miniatures, it is worthwhile showing a sailing boat from Tijucas, Santa Catarina (picture n 7) that was released in sea as an ex-voto, in the hope that, taken by the sea marine current, it could reach Iguape, some 400 kilometers north.

And finally, an ex-voto a miniature of a local fisherman/farmer of the region of Iguape itself. The row and the axe represent the two most important labor tool of local inhabitant: land cultivation and fisheries.(picture n. 8)



Picture 7



Picture 8

The maritime votive offerings of the Church of Our Lord of Iguape are symbols of the religiosity of the coastal people of southern Brazil as well as representations of the dangers of life in the unpredictable sea of the region. The maritime history of Southern Brazil is represented by the pilgrimage center of Iguape, one of the oldest towns of Brazil and its ex-votos. In the beginning of the colonization, the founding of a statue in a desert beach, representing the Ecce Homo is the result of the dangers represented by Protestant pirates in the XVII century attacking the Catholic Portuguese vessels in Southern Atlantic.

The maritime ex-votos represent also the dangers that coastal communities faced in their day to day life: in maritime transportation and fisheries. In this context, the arrival of Azorean migrants in the early XVIII reinforced the existing veneration of Our Lord of Iguape, whose statue was found in 1647. The descendent of Azoreans became the most fervent pilgrims of the Iguape sanctuary and the majority of the maritime ex-votos was offered by them.

After the 70's, the votive paintings became rare, and frequently were replaced by photos. The construction of the main roads linking the southern regions and Iguape in the 60'' has greatly reduced the importance of the pilgrimages by sea, as most pilgrims arrived by road in a shorter trip.

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SOCIAL MARGINALITY AND SEA TENURE IN BAHIA

John Cordell[1]

Marginal Fishing in Bahia

A tattered swamp town in backwater Bahia, Brazil, might not seem to be the sort of place that could harbor an elaborate sea tenure tradition, or, for that matter, productive fisheries. Traditional fishing neighborhoods, sprawling through the mangroves, lie at the bottom of the social heap. In some ways the swamp deserves its reputation as a point of no return - a refuge for the outcast, the crab scavenger, the rootless, landless peasant; a place where those who have nowhere else to go can always find shellfish or *peixe miúdo* ("small fish") to eat to stay alive. Yet the peculiar combination of cultural and spatial isolation that exists on the fringes of society just south of the booming city of Salvador has sheltered and fostered distinctive, independent and cohesive fishing communities.

The *beirados*, people who fish the shallow estuarine and coral-filled waters between Salvador and the Abrolhos Banks, still work mainly from sail canoes, using customary lines, nets, traps and corrals to harvest more than 200 different species of fish and shellfish. Inshore fishing is officially considered to be open access in Brazil. However, this has not stopped groups of beirados from devising their own "Laws of the Sea," and concealing private fishing reserves in the wider marine commons. This study explains key fishery management functions of sea tenure that have evolved under conditions of extreme social marginality in southern Bahia. It concludes with an assessment of recent coastal development impacts on small-scale fishing[2].

As large seafood companies, high-tech fleets, and export and interstate 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 mangrove, estuarine and coral reef home sea territories.

They still continue to land roughly 70 percent of the catch on the southern coast (Silva 1979). Fishing for subsistence or for supplemental income is a critical livelihood alternative for the poor in this region. Today's predominantly black maritime communities formed as successive generations of laborers were excluded from hinterland plantations and, failing to get a foothold in the wider developing economy, turned to the sea and colonized the littoral zone. Although traditional, small-scale fishing evolved in a context of perpetual poverty and social marginality, this process was not haphazard. Over time, certain networks of fishermen consolidated control of valuable water space and established a system of allocating fishing rights.

Typically, the inshore fishing pattern centers around local plantation ports and small, coastal markets. Traditional methods such as the *calão*, a purse seine, have changed little since their introduction by sixteenth-century Portuguese settlers. Over time, control of fishing grounds has become concentrated in different kinds of tenure-holding units, ranging from loosely allied groups of fishing captains, families or informal partnerships to extended ritual kin groupings and individual canoe fishing captains who monopolize intricate net casting locations.

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[1] Director, The Ethnographic Institute, Berkeley, California, USA.

[2] 'This study is based on my field work in Bahia in 1969-1970 and 1976, and on a marine conservation study sponsored by the World Wildlife Fund-US in 1983. The research was extended in 1984 with fellowship support from the Social Science Research Council. I am much indebted to these organizations for their assistance and to Monty Lindstrom and Margaret McKean for their comments on a version of this essay prepared for the Symposium on Common Property Resource Management, Board on Science and Technology for International Development (BOSTID), National Research Council, Washington, DC (April 1985).

Almost all fishing specializations involve discrete territorial rights. Sea tenure patterns cluster around rural towns, neighborhoods within towns, plantation settlements or outlying villages. Locals fish according to what they hold to be the right to exclusively acquire access to chunks of inshore sea space. Conditions of tenure may vary from sequential net casting claims on migratory species lasting hours or a few days, to long-term private claims covering brackish water spawning grounds, reefs and net fishing spots defined by the lunar tide cycle (Cordell1974). Relative mobility of gear and fishing craft, seasonality, microenvironmental zonation, life cycles of fish and a variety of social variables also affect tenure arrangements in a given locale. Rights to fish are characteristically transmitted to limited numbers of apprentices, or kin, and within other long-term social relationships connected to the work setting.

It is important to note at the outset that the forms of sea tenure practiced in rural Bahia have no formal status. Yet, they contradict national fishing codes stipulating that Brazilian territorial waters are common property in the sense of unrestricted access. Officially, as long as boats are Brazilian and registered in a national port, they can move anywhere and take any amount or species of fish. Virtually no enforceable fisheries regulations exist. The government simply does not have the capacity to play a significant managerial role in fishing.

The existence of Bahian small-scale fisheries outside the scope of national fisheries administration raises some interesting resource management considerations: What happens when fishermen are left to their own devices? Are resources and fishing activities essentially unmanaged? Do local fishermen perceive their habitats as open-access commons with no limits on exploitation? Is fishing destined to degenerate into what the polemicist Hardin (1968) calls the "tragedy of the commons"? Moreover, how does fishing under conditions of lifelong poverty figure into the equation? Downtrodden Third World populations are not supposed to be able to afford the luxury of natural resource conservation (see IUCN 1980). Similarly, in some of the "culture of poverty" theorizing about Latin America, social marginality is seen as a foremost obstacle to any adaptive community organization or stable resource management (Oberg 1965; Lewis 1952; Varallanos 1962; cf., Pearlman 1973; Lobo 1982). Thus, one might expect marginal fishing in Bahia to exacerbate the problem of regulating and protecting fragile tropical marine resources.

Initially it is difficult to fathom how groups of politically powerless canoe fishermen can claim to own large stretches of shoreline sea that Brazilian law upholds as common property. Thus, we must inquire how fishermen legitimize their tenure claims in the absence of any supportive formal legal measures outside local communities, and what happens to customary territorial rights as modern markets and fleets penetrate previously isolated fishing grounds. Local net fishing is of special interest in this regard because it contains a number of hidden strengths and paradoxes of working and liveling within the confines of marginality. The class society denies fishermen the opportunity to own much on land but allows them to create, maintain, transfer and defend fishing rights outside the written Law of the Sea. These practices challenge the core assumptions of the common property paradigm insofar as it concerns the nature of competition, philosophies, and strategies of resource use among impoverished groups and the origins of overfishing problems in the marine environment.

It is not necessarily out of reverence for tradition, professional commitment or love of the sea that many fishermen in Bahia today must work from dugouts, slogging through the mangroves day after day, often with little more to eat than the crab bait left over from their traps and trotlines. Living in the swamps is the ultimate measure of marginality; there is no way back into the Brazilian economic mainstream. The Bahian canoe fishing population lacks stable market involvement, and at times even its most fallback fishing strategies fail. A social dropoff at the edge of the mangroves, where fishermen live, is unmistakable. The rural aristocracy has an expression for this disjunction: *fim de rua é fim de gente*, or "where the street ends, so do the people." Swamp dwellers represent a backwardness the government would like to pretend no longer exists in this part of the country.

In the Brazilian economic hierarchy, fisheries in general have low visibility – in 1976 revenue from fishing was only 1.31 percent of the gross national product and 2.5 percent of the total agricultural value (Morris 1979). Traditional fishermen, who have a public image of primitiveness and inefficiency, are often blamed for their industry's low productivity. Yet marginal fishermen in Bahia, contribute

substantially to the area's internationally acclaimed cuisine, and help to sustain the vital tourist industry as well as to seasonally stock branches of the domestic sea food market with fresh fish.

Nevertheless, government fishery authorities generally refuse to acknowledge the value of their product.

Within local fishing neighborhoods, people may go to great lengths to disassociate themselves from the stigma of marginality. In Brazil, to be regarded as marginal often implies not only that you are dirt poor but also that you are ignorant, untrustworthy and possibly criminal (cf., Pearlman 1973). Most fishermen refuse to accept this stereotype. They manage, instead, to transform 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, mas liberal* ("life is hard, but free"). They do not succumb to negativity, but take advantage of their geographic and cultural marginality to work unencumbered by SUDEPE, the fisheries bureaucracy. They are able to avoid purchasing licenses for their boats and gear, or paying dues to the corrupt local fishing guilds (*colônias*), and market a large portion of their fish clandestinely to elude special docking and municipal fisheries tariffs.

This does not mean fishermen ever totally escape the curse of marginality. Families intermittently go hungry and suffer ill health. A psychology of chaotic opportunism pervades some slum neighborhoods, where it often seems that the only way to rise or make ends meet is at someone else expense. Many positive adaptations have developed in fishing society, however, that at least partially offset the pressures of scarcity and marginality. Through elaborate kin and personal networks both ashore and on the water, people support each other. Cooperation and reciprocity combat food shortages, help provide shelter, medicine and clothing, and ease the constant need to repair and replace fishing equipment. Just as marginality has the potential to create economic chaos, widespread suffering and community breakdown, it can also foster innovative and adaptive collective action (see Lobo 1982; Lomnitz 1977; Pearlman 1973).

Traditional canoe fishing thus does not approach the state of competitive social disarray that Hardin envisioned in his "tragedy of the commons" argument (1968), predicting a "remorseless working of things" in common property situations. Similar ideas are entrenched in the anthropological and bioeconomic literature on fishing. Even studies that admit the importance of cooperation among fishermen find in it a thorn of exclusively selfish motives. As Muir and Muir (1982) write 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.*

Elsewhere Muir and Muir (1981) state:

> *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.*

These observers fail to take into account the powerful currency of reciprocity and cooperation, their constraints on potentially destructive competition, and their capacity to assist in sustaining and regulating fisheries and other renewable resources. Economic and social choices open to marginal fishermen are far more complex than a simple dichotomy 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. Ethics associated with respeito go beyond fishing etiquette; they are binding on individual conscience in a way that government regulations can never be. In neighborhoods where capital is scarce, respeito, specifically as it relates to honoring the debts that arise from fishermen exchanging favors, is the measure of people's worth. It is impossible to fish for long in this area without upholding respeito. It is primarily in the context of reciprocity within the encompassing framework of marginality that rights to sea space and fish are established and regulated.

The Purse Seine Tradition

Fishing with the calão, a type of shallow-water purse seine operated by eight-man crews from dugouts six to 10 meters long, is the historic focus of the rural maritime economy in the midcoastal regions of Bahia. It is the lifeblood 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. A 200-300-meter calão typically represents the investment of a fishing captain's life's savings. Few calões are bought brand new, but are usually inherited in various advanced states of use and need extensive repairs. Owning such a net is a fisherman's foremost economic aspiration and a mark of high social standing. The calão is finely designed to capture large schools of estuarine-spawning fish, particularly species of marine catfish (*Tachysurus luniscutis; Genidens genidens*).

Owning this large, encircling net is thought to bring good luck. Nothing better can happen to a fisherman than to bring in one or more canoes loaded with: catfish, which is greatly prized for its flavor and tenderness. A calão crew may land several thousand pounds of catfish in a single outing. When the catch is large, a crew often must leave part of it in a *viveiro* (a makeshift stall set low in the tidal flats to keep fish alive). It is not primarily the profit potential that makes this type of fishing significant, since a good haul of catfish is worth relatively little on the official market, where it is listed mostly as a third-class species. More important is the fact that a good calão catch reaffirms a man's faith that God will continue to send him runs of fish.

A captain takes great pride in bestowing gifts of fish on friends and relatives, and using his shares to pay off debts to middlemen or sponsor beerdrinking fests (*botando banco*). A bar floor littered with broken beer bottles at dawn signifies a fishing captain's good fortune and skill. (Empty beer bottles are valued storage containers; to break them is extravagant.) Beer is esteemed over the rotgut sugarcane distillate, *cachaça. Calão mestres* (captains) and *contra mestres* (net bosses) drink beer; the crew guzzles cachaça (cf., Forman 1970).

Purse seining is the occasion for much social drama. It gives people an opportunity to air their grievances, bestow or withhold favors, praise or ostracize companions, and mobilize participants in social networks. It is conducive to conflict because the stakes are high relative to the catch and earning potential of other techniques. Risks are likewise great because there is often little time to deploy and haul a net against the tidal flow and to get the fish back to market without ice at peak hours before they spoil.

Many people can participate in a single net casting sequence (sometimes several crews of eight to 10 men each), and fishermen spend many hours debating and analyzing what goes on in calão fishing. What is condensed here of their storytelling and fussing illustrates how sea space becomes named, owned, partitioned and governed by respeito, the ethical code, to minimize conflict and regulate access to premium net casting locations. However, to understand specific tenure forms and how they operate on different kinds of fishing grounds first requires a discussion of inshore ecology and the zonation of territories.

Purse seining above all must conform to the tidal changes along the estuaries and creeks that wind back into the mangrove swamps. A system of reckoning the tides based on phases of the moon coordinates all fishing activity (Cordell, 1974). It enables those most adept at net casting, the mestres (canoe bosses), to monitor closely the behavior, migratory routes and life cycles of fish. Because fish predictably concentrate in certain areas depending on the tide, weather and other natural cycles, seining operations are specialized. Favorably located water space is 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 gained control over premium water space, 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 sq km to 600 sq km. Area is restricted by the distribution of species close to shore; by the fact that the sail canoes, even those that are

motorized, cannot effectively carry much ice or maneuver safely very far offshore; and by consumer demand for a daily supply of fresh fish.

In the northern portion of the fishery around the port of Valença (Map 2), there are 258 traditional net casting grounds (pesqueiros) broken down by season and tide cycles. Because of the way the contours of the estuary are swept by currents, a spring tide in the inner reaches of the fishing area is like a neap tide in the outer reaches, and vice versa. Fishermen can therefore use most of their techniques every day, so long as they choose fishing spots appropriate to the day's tidal regime.

Pesqueiros are the basic microenvironmental and tenure units of fishing. However, each one usually accommodates a range of methods (hand lines, trotlines, set nets, traps, seines). Pesqueiros are subdivided into *lanços*, or minimal water spaces, as determined by fortnightly current changes, daily tide-level changes, visibility during different phases of the moon, position of the *lanço* relative to the shore slope, bottom conditions and the interactions of wind and current so people using different techniques do not interfere with each other. 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. Fishing captains name and assign proprietary rights to all these tiny chunks of lunar tide fishing space.

Claims to fishing spots have relevance as geographical reference points only in the context of the lunar calendar. Seining and nearly all canoe fishing move in a circuit of areas activated by the tide cycle along the channels of the estuary and mangrove creeks. 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 this sea tenure pattern evolved in Bahian canoe fishing. There are no court records or laws to support fishermen's claims. Yet sea space controlled by the community, individuals and social networks has existed over the span of the oldest fishing captains' memories. Knowledge of the system is passed on through a limited number of apprenticeships, which can last up to 10 or 15 years. Not all apprentices become proficient net casting specialists and equipment owners who may inherit rights of access to the most valued fishing grounds. Lessestablished captains venture into marginal areas of the fishing grounds, where new fishing spots can be discovered and staked out from time to time. There are also intervillage 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. In sum, although resource availability ultimately limits catches in Bahia, as in other fisheries, a more immediate check on sea tenure and fishing pressure is the fixed water space opportunity configuration for using purse seines.

Customary Social Relations

The Bahian coastline is indented by estuaries, swamps and tidewaters dotted with sedimentary and coral reefs. These comparatively sheltered waters facilitate the marking off of fishing claims. In addition, the proximity of fishing grounds allows a high degree of territorial surveillance from home ports. These conditions alone, however, do not explain the origins of sea tenure or how it becomes legitimized. These questions lead away from environmental considerations into the realm of ideology and ethics of "socially acceptable" fishing. One aspect of traditional sea tenure in Bahia is that fishermen do not always have to be physically present to defend their territories or to make them real. People honor respeito; likewise, they respect each other's claims.

Ethical net fishing involves deference as well as honor o "respeito" is created and reaffirmed through sometimes trivial and sometimes substantial acts and gestures of reciprocal benevolence. A cogent illustration of the honor code is the way fishermen cape with potential and actual competitive encounters while fishing in intervillage buffer zones. What often happens to create territorial conflict in unclaimed or less-fished waters is when several boats, all going after a sizable school of fish, arrive simultaneously on a pesqueiro. In these situations, because of limited tide intervals, there may only be

roam and time for a single optimal net cast. In this case, 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 per boat. On this basis, captains decide whether to remain on a spot. Ordinarily this queuing pattern works out well, but sometimes a boat will not close its seine and draw in the catch in the allotted time. If the next boat in line begins its operations regardless, the two nets can become fouled.

Within a community's fishing grounds, even where tenure of lunar tide space is clear cut, accidents do happen. Although units of net shooting space have been worked out over time 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. If this happens, fishermen may observe spatial boundaries correctly but may miscalculate time boundaries. Although the resulting territorial infringements might appear superficial, they nonetheless have the potential to disrupt social relations in fishing.

Canoe fishermen take a certain amount of competition and boundary fuzziness for granted. The limits that people will tolerate depend on the extent to which competitors are linked by the honor code. Within these limits, which vary between individuals and across social networks, people try to get away with whatever will increase their fishing success. It is not unusual to find a fishing captain buying drinks for a competitors crew in hopes of getting them to a drunk to leave in the time required to reach a mutually desirable fishing spot.

Where there is serious conflict over a fishing claim, most captains prefer to act deferentially toward competitors rather than force the issue. Such ostensibly one-sided concessions may appear self-defeating. However, a posture of noninterference increases a skippers respectability, upholds the cooperative ethic and sets up future debts. A captain knows who can and who cannot be trusted to stay within constituted bounds of competition and honor.

One additional tactic minimizes the possibility of competitive encounters. When a captain wishes to fish a particular spot outside the system of lunar tide property rights, he announces his intention several days in advance at a local bar where other fishermen are present as witnesses. He must announce the tide level or series he will use 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 go to the chosen spot the day before fishing and leave an anchored canoe with paddles sticking up in the air to forewarn competitors that the casting space is taken.

Failure to follow these roles can be devastating. Collective social pressure to conform to the ethics of fishing is reflected in the *olho do povo* (the community's watchful eye), reminiscent of the forceful moral and ethical standard in Palauan fishing expressed in the title of R.E. Johannes' book, *Words of the Lagoon* (1981). Reputations rise and fall in terms of the olho do povo.

The community may find territorial competition in fishing more or less deliberate or accidental, and more or less antagonistic and deserving of counteraction.

Just as it rewards those who follow respeito, the community may withdraw the benefits of exchange and reciprocity from people who breach it and consistently create conflict in fishing. The most severe sanctions occur when an entire network of fishing captains denies territorial use rights to a chronic troublemaker who refuses to honor their lunar tide claims. Territorial defense proceeds in a variety of ways: sabotaging equipment, setting a canoe adrift on the tide or deliberately competing in net crossing. These tactics 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 a crew and acquiring information on weather and catches all present opportunities for small favors. Some favors are worth more than others-such as giving someone a tow in from fishing (*reboque*), helping to string a trotline (*o estender da linha*) or bringing special wood of the white mangrove to form crossbeams for a house. All these exchanges create goodwill in fishing.

Perhaps the most explicit display of cooperation and respeito occurs during the peak catfish season, in June and July. Preferable net fishing spaces at this time are narrow due to tidal fluctuations, maximizing the chance of conflict over water space. To relax spatial restrictions in the lunar tide property system during this time, fishermen enter into temporary partnerships (*fazer sociedade*) that dissolve when the spawning runs subside. This is practical; since catfish enter the estuary in such large schools, a single boat and crew cannot do justice to the catch potential. If a catch is too large to fit into several boats, one crew's net serves as a *viveiro* (temporary fish corral) out on the tidal or reef flats. Then, following the main catch, boats can return to the viveiro for more live fish.

Another important occasion for exchanging favors involves fish marketing. Some captains double as fish hawker-gamblers (*pataqueiros*). They are supposed to be licensed by the mayor's office, but because there is considerable moonlighting, it is difficult to control their activities. Fishermen can always find black market buyers who usually pay slightly less than the going rate in the official market. Selling fish to a pataqueiro enables one to avoid paying a weight - and class - specific tax and eliminates the annoyance of going upriver to 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; fishermen must usually sell to them on credit (fiado).

Because of the way pataqueiros operate, a great deal of mutual trust (confiança) must accompany such transactions. Selling on credit registers 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. If a price is negotiated and a transaction falls through, the pataqueiro must cover the loss himself, proving even further respeito between the parties involved. If the pataqueiro fails to fulfill his end of the deal, witnesses can usually exert enough pressure through gossip and verbal censure to extract the amount due.

For Bahian purse seiners, perhaps the strongest demonstration of the cooperative ethic occurs in the context of godparenthood, with its distinctive rituals and obligations (*compadrio*). In November, when the rainy season tapers off and a hot, summery net casting season begins, the outermost ocean beach fishing spots open up. As the 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 easily arise. One way to gain access to new territory and to fish safely in the waters of an adjoining community is to become a godparent.

The first step in becoming a godparent 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 an initial display of goodwill, the visiting captain may volunteer for or accept the role of godparent to another fisherman's child. Such relationships are frequently established after only a brief acquaintance; their major benefit is to confer summer fishing rights that 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 with a local compadre. This precaution ensures that the crew will receive good treatment if they have to go ashore, and reduces the threat of competition during net casting sequences. Some people only venture into interstitial areas to fish when they have compadres or kin in adjoining villages.

Godparenting establishes wide-ranging circles of fishermen bound by respeito. It is also partly responsible for the cooperative extension of sea tenure within a community. Purse seiners in particular have large personal networks with many godparent connections, which often run through a series of villages. This extension of sea rights restores an element of flexibility in fishing where waters are otherwise exclusively used and claimed by single villages or by fishing networks and individual captains within each community.

Disunity and Keeping the Peace

From time to time, territorial competition escalates into disputes over fishing rights. In these cases, stringent social controls may be invoked. Most captains espouse an "eye for an eye, tooth for a

tooth" brand of justice. They recognize the danger of letting someone get away with violating their claims and consider it necessary to punish encroachers so no one will become addicted to wrongdoing (ficar viciado). To reprimand those who get out of line and to help settle serious rifts, certain individuals serve as mediators (conselheiros). Conselheiros are people to be emulated; they epitomize respeito in all they do. Usually retired fishing captains or, in some cases, fishermen's widows, conselheiros take an active interest in the welfare of the fishing community as a whole. They are constantly sought out for advice and they exhort fishermen to maintain respeito in times of controversy.

Although more or less deliberate incursions into private fishing space are a common cause of disputes, they are seldom the only cause. Conflicts cannot usually be traced to isolated events; they involve accumulated hostilities indirectly affecting many people. Conselheiros must be able to comprehend and soothe social relationships that have fluctuated and festered for a long time. A dispute is thought of as a state of disunion (desunião), which has a characteristic form and moves through distinctive phases (cf., Yngvesson 1978). Prolonged disputes may span several generations and set off vengeful acts (vingança) and intense feuding.

Disputes tend to begin with problems on shore that carry over into fishing. As a result of some disagreements that develop in this context, captains may try to claim each other's fishing spots by force. When claims are violated, owners have various ways to retaliate -poaching, stealing equipment, sinking competitors' canoes, and boobytrapping fishing spots with jagged tree trunks and boulders capable of ripping an intruder's net to shreds. In extreme cases, fishermen fight with machetes.

In serious disputes, fishermen feel they have the right to avenge injustices and are not inclined to seek help from police in nearby towns. At the request of the local sheriff, unrest in the fishing communities could be handled by state military police, who have garrisons in the major seaports along the southern coast. But fishermen believe their swamp neighborhoods lie outside the state and local townships' jurisdiction. They think their homes and fishing grounds come under the control of *the Marinha* (Brazilian navy). Canoe fishermen contend that whatever happens in the marine environment must come under this special sphere of "federal" jurisdiction.

Under Brazilian law, authority over land and sea is separated, and the navy historically has regulated fishermen's activities such as registration in professional organizations (cf., Forman 1970). But most of these regulations never penetrate the mangrove swamps, and fishermen have little experience with the powers of various naval authorities. Their only contact in this regard is through indifferent *capatazes* (local port captains), who, for the most part leave fishermen to settle their own affairs. This laissez-faire situation underscores the predominantly marginal character of traditional swamp fishing in terms of national legalities and politics.

Because they are so far removed from government and legal authorities, fishermen believe 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; on "federal" territory he is supposedly safe from prosecution. Fishermen know how to exploit their marginality and play the thinly spread land and sea officials of rural Bahia against each other. Since sea crimes are not considered directly translatable to the domain of land authorities, fishermen feel free to exercise their own brand of "bush" justice (vingança) in the course of disputes.

Conflict over fishing claims also frequently results from family quarrels (infidelity, wife beating, disagreement over inheritance of bens [assets such as a house or fishing equipment]). To explain their taking of a fishing spot by force in reprisal for a wrongdoing, fishermen cite a psychological precondition that might best be described as mixed anger and shock (*pessoa fica apavorada*). A confrontation on the fishing grounds such as a canoe ramming, especially if anyone gets hurt, sparks great drama in the fishing neighborhoods: public exchanges heat up, threats and counterthreats fly and occasionally "all hell breaks loose" (barulho).

There is only one way to end hostilities among fishing captains, crews and families, and to restore good relations when grievances intensify to the point of violent confrontation: the affair must be brought before a conselheiro.

In order for the mediating effort to be successful, the combatants have to want to air their grievances. The conselheiro's primary aim is to promote reconciliation. To do so, he or she invokes respeito (the cooperative ethic) as it is reflected in the *olho do povo* (the sense of community justice), and brings this pressure to bear on individual consciences.

Thus, resolution of a dispute does not fix blame -a clouded issue at best in lengthy feuding - or punish. Conselheiros negotiate reunion by appealing to the community sense of fair play; they attempt to restore equality in relationships. A simple, face-saving gesture (salvar a cara) by either of the injured parties suffices for openers: humbling oneself and showing that one no longer carries a grudge (*carrega mágoa*). If successful, this strategy will lead to an exchange of a little kindness (*troca de fineza*) in goods and services. This conciliatory gesture need not be large; it mar consist of a gift - perhaps a fish or a tow in from fishing in bad weather -that would otherwise seem insignificant. The main point, however, is for people to begin reestablishing respeito. By exchanging such favors and making small concessions, fishermen frequently are able to come to terms, renew cooperative relations and reaffirm the value of personal deference in avoiding water space challenges.

Network Regulation of Fishing

Marginality has not precluded effective social controls or territorial management in Bahia's traditional fishing areas. Although they would like to own a piece of land, the coastal poor settle for owning chunks of water space. The importance of personal networks as an adaptation both to the exigencies of lunar tide fishing and of marginality cannot be overemphasized. There are almost no alternative employment opportunities outside of fishing.

A system of customary sea rights built around fishermen's networks, linked and legitimized by respeito, thus becomes economically significant. Reciprocal obligations among captains and between captains and apprentices amount to an indispensable kind of personal insurance; an extensive personal network means security.

Fishing neighborhoods are characterized by a high ratio of dependents to breadwinners. Moreover, 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, changing fortunes lead to fluid patterns of friendship and coresidence. Biological kinship motivates people to remain attached, but it carries no guarantee of permanent relationships. People cluster around anyone who can provide for them.

Against this background, men's social networks take precedence over the family and other domestic groups as the pivotal socioeconomic unit in the fishing villages. Within their networks, men rely on each other for favors to sustain their livelihood and that of their dependents. They are open at every moment to the possibilities of exploiting personal relationships for what they need, but this maneuvering is accomplished with great finesse, spontaneity and genuine affection; it is not done through crass manipulation. Marginal fishermen, too, can become artists at being personable and charming (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). Although these enticing qualities of social interaction are by no means uniquely Brazilian or linked to marginality, they clearly texture fishermen's activities and behavior within their networks of friends, compadres and other contacts. Extending sea rights in the context of godparenthood relations, resolving disputes through deferential acts that enhance one's reputation, hosting extravagant beer-drinking contests that exhaust a fishing captain's earnings while boosting morale -all these events unfold within the economics of scarcity and reciprocity.

Reputation-enhancing acts such as "becoming humble" that indirectly and cumulatively help control competition in fishing are perhaps borrowed from interaction in the region's stratified face and class system and put into the different context of social drama in fishing. The Bahian poor, drawn mostly from the darker end of the racial spectrum, are obliged to show proper humility to gain what patronage they can from the rich. In any case, it is interesting to observe how fishermen transpose and perfect patron-client relationships to their own ends and within their own hierarchies.

Canoe fishermen like to imitate and mock the rich in a guise of noblesse oblige. This is the spirit in which one captain, flanked by huge coconut plantations, made a sweeping gesture toward the mangrove swamp and proclaimed from his dugout: "essa fazenda é minha" ("this is my plantation").

Management of the purse seine tradition is socially diffuse, involving decisions by a number of controlling groups or networks. The configuration of territorial ownership itself is not what controls fishing. Sea tenure is, rather, an extension of the special cooperative bonds fishermen cultivate with one another. Territorial rights regulate participation in fishing. Apprenticeships and associated crew recruitment and mobility channels in primary types of net fishing act to limit entry to the fisheries in question and, albeit indirectly and unintentionally, curtail fishing pressure.

Impacts of Development

Collectively defensible sea territories, which only marginal fishermen know how to locate and use safely and productively on a sustained basis, discourage encroachment. Local fishermen can enforce territorial claims against competitors of similar economic means. However, the fact that sea tenure is legitimized only by internal mechanisms like respeito also suggests how easily it can be subverted by modern fishing technology and expanding markets.

Traditional fishermen are highly vulnerable to territorial displacement, loss of sea rights and resource "piracy." All that is required to disrupt the noncompetitive distribution of purse seines and other gear in lunar tide fishing space is for an external power to assert domain - easily done in Brazil through national laws declaring inshore seas to be public property - or for a local enclave to begin using competitive new technology. Local fishermen cope less effectively with entrepreneurs or with nonresident vessels, which have no reason to respect local customs and can simply move on after depleting local resources. Canoe fishermen's code of respeito soon loses its raison d'être and breaks down when there is no longer anything to gain through cooperation or by honoring traditional authority or autonomy.

Such encroachment by inappropriate gear and nonresident boats began more than a decade ago. As early as 1970, nylon nets were competing with traditional gear for identical species and water space. Hundreds of monofilament nylon gill nets and seines were introduced by the fisheries agency (SUDEPE), which provided loans and tax incentives for investors[3]. Affluent strangers bearing nylon nets were unable to coexist peacefully with the established purse seiners, and cutthroat competition for limited net casting spaces began in earnest. This rivalry has altered the distribution of equipment in the area around the port of Valença and the concentration of gear and boat ownership in different fishing categories. Traditional nets tend to be abandoned in favor of secondary methods such as mobile trotlines and fish corrals, which have a fixed seasonal location and an uncontestable exclusive or even private tenure status. By far the greatest reduction of gear has occurred in the category of traditional natural fiber nets. On the whole, net fishing has declined since 1970; but traditional purse seining, which is remarkably

[3] For the past 25 years Brazil has pursued policies of unrestricted fishery development, encouraged by a number of fiscal incentives for entrepreneurs and investors. *Decreto-Lei* 221/67 provided tax exemptions of 25-75 percent on personal income invested in fishing; it suspended import tariffs on fisheries technology and craft and various federal taxes on catches destined for luxury internal and export seafood markets. These incentives supersede the 1938-1939 fisheries codes (Códigos de Pesca), which contained some potentially useful - though unenforceable - management concepts such as exclusive zones for fixed-territorial methods like fish corrals. The tax incentives remain in effect at this writing and will probably be prolonged despite recent sobering catch statistics.

Falling catches are illustrated by changes in shrimp and several other major species. With one of the most extensive coasts in the world (nearly 8,000 km) and a favored climate, Brazil ranks among the 10 largest shrimp-producing countries. However, the total shrimp harvest, which reached a high of 129,000 tons in 1972, decreased to 79,000 tons in 1979 (Silva 1979). Exports rose somewhat during this period from 6,783 to 7,172 tons, but per capita consumption decreased from 0.506 kg to 0.197 kg (Silva 1979) 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 (IBGE 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 to 858,000 tons (IBGE 1981:354-355), indicating a nationwide leveling off of production. The five principal species caught - tuna, corvina, shrimp, lobster and sardines - have declined in numbers since 1979 (Nascimento 1982).

well adapted to estuarine fishing and to the social organization and redistributive food networks of poorer neighborhoods, is making a slight comeback.

As a result of uncontrolled innovation and encroachment, rich but biologically fragile tropical nursery-area fisheries have been gravely damaged, and shot-term speculation and overcapitalization have led to sudden overfishing of a number of native estuarine and reef species. Previous studies of the Valença Delta (see Map 1) have recorded the debilitating changes in canoe fishing society that began with the arrival of nylon gear (Cordell 1973, 1978). Since 1970, conservation problems have worsened in this area and all along the southern shores of Bahia, as far as the Abrolhos Archipelago.

Not only fisheries development, but also oil exploration, shipbuilding, tourism, lumber, agriculture, aquaculture, mining and heavy metal processing have greatly intensified. New roads have been built into the region, making it accessible from the large urban centers of southern Brazil and the state capital, Salvador[4]. The greatest exploitation of fisheries has been near the major cities and near shore. A critical area of actual and potential overfishing now extends from the landward range of mangrove swamps out to a depth of 50 meters, which roughly corresponds to the limits of most inshore fishing gear.

Two of the most visibly destructive pressures on inshore species are the aforementioned use of monofilament nylon nets and the invasion of marginal fishing territories by out-of-state trawlers and longliners. The unregulated use of nylon gear - a single vessel mar set several kilometers of nets - is implicated in territorial conflicts, equipment foul-ups and reduced catches with traditional gear. The blockade effect of coterminously set gill nets may also adversely affect spawning runs. Trawling has stepped up between depths of 20 and 50 meters. Power boats with small mesh seines for shrimp harm many other demersal species. In general, modern trolling and trawling interfere with the operation of traditional methods and can irreparably damage small-scale fishermen's set gear, particularly during spawning runs when they compete for the same spots and species.

In recent years, fish prices across the board have skyrocketed as local waters can no longer supply the major seafood markets in Salvador and Ilhéus. 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 inshore 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 by outsiders in its own waters. In 1983, the price of first-class species such as snapper and shrimp rose 105 percent, more than any other item in the cost-of-living index. Some previously rich estuaries such as the Valença Delta have been fished so heavily by outsiders that the only marine products available in local markets are frozen corvina trucked in 2,000 km from São Paulo, salt cod imported from Nova Scotia and expensive canned salmon from Alaska.

In Valença and other southern ports, decreases in commercial finfish landings have increased pressure on shellfisheries. Increasingly, fishermen who once worked the estuaries and reefslopes with large encircling and dragging nets have had to turn to shellfish resources of the swamp to survive.

The selective introduction of nylon leaves part of the delta fishing community with traditional technology, while others have switched their 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 for meager fixed wages. Traditional captains have to be conservative with their equipment, 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

[4] Additional impacts on coastal fishery resources that are difficult to quantify include stepped-up drilling and exploration by the Brazilian oil company, PETROBRAS; biocide run off from plantations in the littoral zone; increasing landfill for highways, resorts and other construction; and widespread 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 due to the extraction of limerich deposits.

sea marks the end of an era in which marginality was the small-scale fisherman's hedge against encroachment and overexploitation of marine resources.

Today in Brazil, developers linked to rapidly expanding interstate seafood markets reach out to capture supplies of fish and shellfish, which up to the present have been the subsistence reserves of the coastal poor. It is not technical innovation per se that is destructive, but the way in which change proceeds, disrupting customary sea tenure, removing incentives for cooperation and the territorial autonomy that local groups need to fish sustainably and without conflict. Unprecedented conflict in Bahia's fisheries demonstrates that the "tragedy of the commons" can be contained by traditional sea tenure and is brought on by the breakdown of such institutions.

Conclusions

Both the conventional view that fisheries are invariably open-access resources and the argument that marginality inhibits constructive collective action fail to account for what we find in Bahian fishing communities before the arrival of outsiders: traditional fishermen successfully managing inshore fisheries. Both theories assume that there is no relatedness or strategic interdependence among people who use resources jointly (cf., Runge 1983).

Both contain a certain cynicism about human nature; neither allows for community. The Bahian case, if anything, indicates that sea tenure is a logical mechanism for allocating scarce resources and that poverty strengthens cooperative social organization.

With extended maritime jurisdiction, many countries, including Brazil, assume sweeping new powers and responsibilities for managing resources without any coherent frame of reference or forum to evaluate fishing claims, particularly traditional ones, or to define and justify new allocations of use rights. Arguments concerning the relative superiority of public or private ownership ignore the value and legitimacy of a third category, that of exclusively collective ownership. This study offers practical reasons for the development of inshore tenure that suggest why governments might support such traditional institutions. Fishing productively and sustainably near shore requires regulation of access. Thus, fishermen need something approaching guarantees of restrictive community tenure and recognition of the importance of their customary, limited-entry recruitment procedures.

If Brazil and other tropical countries are to begin serious, long-range management of their marine resources, they must prepare to take into account a wide range of customary rights and claims to the sea that they do not now acknowledge. The real managerial strengths in Third World coastal fisheries are indigenous, vested not in the state or its bureaucracies, but in fishermen's own informal institutions norms and cooperative organizations.

It is difficult to convince fishery authorities that traditional sea tenure even exists in places like Bahia, much less that it is worth preserving. Fishermen's laws are nontechnical and, admittedly, somewhat intangible to the uninitiated. Sea tenure is a kind of invisible wealth, created and maintained for both material and nonmaterial ends. Yet beneath the ragged, impoverished exterior of swamp-fishing communities are rational and proven solutions to problems of sharing, partitioning and maintaining 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 available to the coastal poor in Bahia and other parts of northeastern Brazil. Establishing sea tenure through their own unwritten laws helps local fishermen transcend the misfortune of being born "marginal." Sea rights, in place of land rights that seem forever beyond their reach, give fishermen a group identity, honor, some sense of security and a chance to own something in the highly class-stratified society of northeastern Brazil. Paradoxically, the marginality that keeps them poor also gives them the independence to invent and speak boldly of their "sea rights," and sometimes to sing like birds and dance as they walk.