# Opportunities and problems for participatory management in the Peixe Lagoon National Park, southern Brazil

by

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# Opportunities and problems for participatory management in the Peixe Lagoon National Park, southern Brazil

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## Abstract

This thesis was developed in a context of conflict between traditional *açoreanos* fisher communities and the environmental agency responsible for the implementation of a National Park in the Peixe Lagoon area, southern Brazil. An investigation of the advantages of, and barriers to, integrate those communities into protected area management was carried out. Peixe Lagoon fishers have inhabited the area for a long time, developing a unique culture and detailed knowledge about the local environment. Their practices (such as opening of the lagoon mouth) have maintained the wetland which is now the objective of conservation. However, the National Park status in Brazil requires people-free protection and no resource use. The objectives of the present thesis were (1) to investigate community self-organization, local institutions and resource management strategies; (2) to examine the community's own agenda and concerns for the protected area; and (3) to explore institutional linkages both at the local level and across levels of organization, as related to the management of the protected area.

A number of local management strategies were in place, governed mostly by informal rules. The level of community self-organization and leadership was poor, jeopardizing meaningful participation in existing multi-stakeholder bodies. Perhaps more important, the lack of long-term rights and resource tenure gave little incentive for fishers to participate in management, thus hampering fishers' ability to take actions that significantly affect their own future. Although the two Peixe Lagoon fisher communities (beach fishers and urban-based fishers) had somewhat different agendas, they shared the same top priority: maintenance of livelihoods. Concerning the third objective, the local communities had few linkages with the outside. However, opportunities existed for further improving institutional linkages and establishing new ones. Institutional support for Peixe Lagoon fishers was limited, but it nevertheless enabled them to defend their access to resources which sustain their livelihoods. Achieving conservation without compromising local fishing livelihoods may be possible through a change in the status of protected area. The thesis ends with suggestions for effective participation in the case of change of status to enable conservation without compromising local fishing livelihoods.

## Acknowledgements

I would like to thank from the bottom of my heart all those who have contributed for this thesis to be done. If my words are limited to express my gratefulness, only I know how intense my inner feelings on this matter are. This is not only for those who provided direct inputs but also for all the special people behind the scenes who support me with their love, care and friendship.

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## List of Acronyms

**APAT** – Association of the Artisanal fishers from Tavares
**CONAB** - National Government Agency of Supply and Services
**CNPT** – National Centre for the Sustainable Development of Rural Traditional Populations, Instituto Chico Mendes
**CNPCT** - National Commission for the Sustainable Development of Traditional Populations and Communities
**EMATER** – Agency for Technical Assistance and Rural Extension
**FARSUL** –Agriculture Federation of the Rio Grande do Sul State
**FSPH** – Fish Storing and Processing House
**FURG** – Federal University of Rio Grande
**IBAMA** – Brazilian Institute for the Environemnt and Renewable Natural Resources
**ILO** – International Labour Organization
**IUCN** – International Conservation Union
**NEMA** - Nucleus of Environmental Monitoring and Education - environmental non-governmental organization from Rio Grande city
**PLNP** – Peixe Lagoon National Park
**PRONAF** – Federal Funding Program for Rural Development
**PUC-RS** – Catholic University of Rio Grande do Sul state
**RDS** – Sustainable Development Reserve
**RESEX** – Extractive Reserve
**RS** – Rio Grande do Sul State
**RS-Pesca** – Rio Grande do Sul State Funding Program for Small-scale Fishers
**SEAP** – Special Secretariat for Fisheries and Aquaculture, Presidency of the Republic of Brazil
**SNUC** – National System of Conservation Units (protected areas)
**TEK** – Traditional Ecological Knowledge
**UFPEL** – Federal University of Pelotas
**ULBRA** – Lutheran University of Brazil
**UNESCO** – United Nations Educational, Scientific and Cultural Organization
**UNISINOS**- University of the Sinos Valley
**UFRGS** – Federal University of Rio Grande do Sul State

# Chapter 1: Introduction

## 1.1 Context of the Research

The creation of the Peixe Lagoon National Park (PNLP), on the coast of Rio Grande do Sul State, southern Brazil, caused a conflict between traditional resource users and the environmental agencies responsible for implementing the protected area. That is because National Park designation in Brazil does not allow people to use and extract natural resources (Brazil 2000). However, traditional fisher communities have lived in the surrounding area of the Peixe Lagoon for centuries, developing a unique culture and detailed knowledge about the local environment. The present thesis is concerned with this conflict and the means to minimize it through the inclusion of the traditional fishing communities in the management of the protected area.

In the year 2000, a new law regarding conservation units (term used to refer to protected areas in Brazil) was approved. The Law 9985/00, also known as SNUC (acronym in Portuguese for the National System of Conservation Units), demands recognition of the rights of traditional population to maintain their livelihoods. Prior to that, the implementation of protected areas in Brazil has historically followed a 'parks-no-people' approach. As a consequence of the exclusion of local communities, conflicts over land tenure are quite common all over the country (Charity and Masterson 1999, Diegues 2008).

SNUC regulates all the different types of protected areas in the Brazilian territory. Those are divided in two main groups: integral protection conservation units and sustainable use conservation units. The basic difference between them is that extraction of natural resources is allowed in the first group and forbidden in the second (Table 1).

National Parks are a restrictive category within SNUC. According to the legislation, National Parks have the objective of preserving ecosystems of high ecological significance and scenic beauty, allowing for scientific research, environmental education, recreation and ecological tourism. Following those objectives, all private lands must be turned into public lands, and no people must live on the protected area or use its resources.

**Table 1: Types of Brazilian protected areas and their main purposes**
(Brazil 2000)

| Types of protected areas | Main purpose | Examples |
|---|---|---|
| **Group I: conservation units of integral protection** | **Environmental preservation, without direct use of natural resources** | **- National Park<br>- Biological Reserve<br>- Ecological Station<br>- Wildlife Reserve** |
| **Group II: conservation units of sustainable use** | **Environmental conservation combined with sustainable use** | **- Extractive Reserve<br>- Reserve of Sustainable Development<br>- Area of Environmental Protection** |

Contrary to the exclusionary and top-down approach used in the establishment of the Peixe Lagoon National Park, there is an increasing recognition that government and local people must work together to make environmental conservation more likely to succeed (Webler *et al.* 2001). Communities can facilitate government agencies to realize the most meaningful issues (Johnson *et al.* 2003). At the same time, people trust and respect more policies and decisions they help to create. Citizen participation has been demonstrated to be essential for enforcing the rules governing coastal and marine resources (Rakotoson and Taner 2006).

Such co-management arrangements and multi-stakeholder bodies have emerged as a way to bring different stakeholders together in order to create more impartial, effective and efficient management outcomes (Jentoft 2003). Benefits of co-management include a higher level of equity (Pomeroy and Berkes 1997), lower transaction costs (Jentoft 2005), and reduction of uncertainty due to knowledge inputs by resource users (Kalikoski and Vasconcellos 2007).

Co-management systems imply the sharing of power and responsibility between the State and other stakeholders, including the community of resource users (Carlsson and Berkes 2005). Successful co-management arrangements depends on the ability of the community to self-organize in order to negotiate with external institutions (Colchester 1997, Berkes and Seixas 2004) and on the strength of the institutional linkages created among the different stakeholders (Pomeroy *et al.* 2001, Berkes 2002).

In the Peixe Lagoon case, the communities have devised their own traditional institutions adapting to changes that create vulnerabilities, such as climatic change and new governmental policies (Almudi 2005). These institutions are similar to those created by communities in some other parts of Southern Brazil, such as fishers from Patos Lagoon (Kalikoski and Vasconcellos 2007) and Ibiraquera Lagoon (Seixas and Berkes 2003). However, those institutions have not been recognized by the Brazilian government, hindering a more transparent and competent management of the protected area.

The Brazilian legislation makes a distinction between indigenous and traditional communities. The latter belong to different sub-cultures that have emerged from a fusion of Europeans, Africans and Indians. Examples of such groups are *caiçaras* (fishers from the Southeast coast), *ribeirinhos* (inhabitants of the rivers margins in the Amazon), *sertanejos* (small-scale cattle raisers from the northeast) and the *açoreanos* (Azorean fishers that mostly inhabit the coast of southern Brazil) (Diegues 2008). The fishers in this thesis are descendants of Azoreans and are legally recognized as a traditional (but not indigenous) population, having a distinctive culture that includes specific customs, ways of speaking, religious ceremonies and so on.

The governance of protected areas in Brazil is currently under the responsibility of Instituto Chico Mendes de Conservação da Biodiversidade (Chico Mendes Institute of Biodiversity Conservation). This agency was created in 2007, taking on part of the mandate that used to belong to IBAMA. While Instituto Chico Mendes took the responsibility for the creation, establishment and management of protected areas in the national territory, the responsibilities of IBAMA became limited to environmental licensing and enforcement outside protected areas. While this research was being done, some of the Peixe Lagoon National Park officials had already been officially transferred from IBAMA to Instituto Chico Mendes. As fishers generally still refer to the Peixe Lagoon National Park administration as IBAMA, I have chosen to use the terms 'National Park administration' and 'IBAMA' interchangeably in this thesis.

IBAMA have national and state offices that head decision-making regarding the National Park, i.e. the Park's superintendent must report to those offices. Officials working in the municipal office, located in the border of the protected area, respond to

officials working at the provincial (state) level. The latter communicates with the federal IBAMA office in the Brazilian capital, and that office is directly connected to the Ministry of Environment.

As a result, the local resource users and protected area management are influenced by decisions taken in different levels of hierarchical organization within IBAMA. Although most of the decision-makers barely had some direct contact with the social-ecological context of the Peixe Lagoon, their decisions have a tremendous impact over the measures adopted in regards to environmental conservation and maintenance of local livelihoods.

### 1.2 Study Area: The Peixe Lagoon National Park

The Peixe Lagoon has approximately 35 km of extension and an average of 1 km of width and is situated in the central portion of the Rio Grande do Sul State coast, in the narrow sandy strip between the Patos Lagoon and the Atlantic Ocean (Figure 1). Its geographical coordinates are 31°26' S; 51°09' W and 31°14' S; 50°56' W. The average depth of the Lagoon is lower than 50 cm with exception of some channels that can be slightly deeper than 2 m (Loebmann and Vieira 2006).

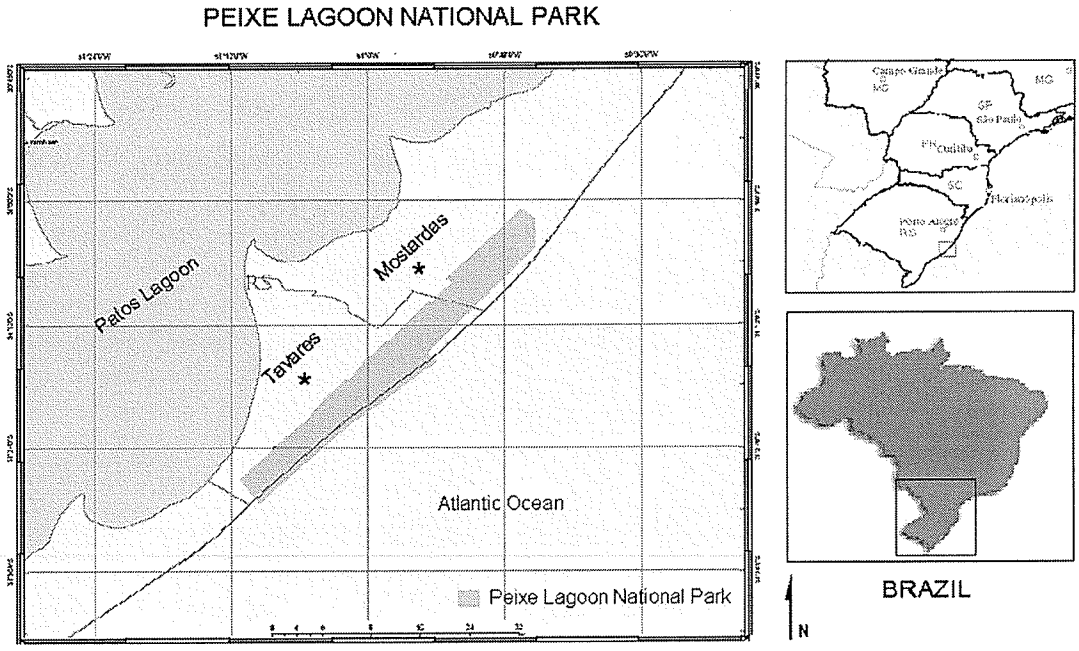


**Figure 1: Location of the Peixe Lagoon National Park, Southern Brazil**

Peixe Lagoon has an intermittent connection with the ocean through a mouth located in its central zone. When the Lagoon mouth does not open naturally at the end of the winter season, the local population will open it. The connection with the sea allows for species and nutrient exchanges, making the Lagoon a nursery and feeding place for diverse species of mollusks, crustaceans and fishes, among other typical estuarine species (Knak 2004). For this reason, Peixe Lagoon also presents a great abundance of endemic and migrant birds that periodically visit this region migrating from the south (Argentina) and from the northern hemisphere (Resend 1988) – Figure 2.

**Figure 2: Flock of herons at the Peixe Lagoon**

Due to difficulties of access, the urban development of this region is sparse. Only two small cities (Tavares and Mostardas), which together have around eighteen thousands inhabitants, are found in the surroundings of the Peixe Lagoon (Tagliani 1995). Since the first Portuguese immigrants had occupied the region, in the middle of the eighteen century, they have developed agriculture, cattle raising and fishing as source of income and subsistence (Tagliani *et al.* 1992).

Based on the recognition of the importance of this Lagoon for migratory birds, the Brazilian government in 1986 decided to transform an area of 34000 ha surrounding the Peixe Lagoon into a National Park. Therefore, the protected area encompasses not only the Peixe Lagoon ecosystem but also surrounding ecosystems such as spit forest, dunes, small fresh-water lakes, beach and ocean.

### 1.2.1 **Study community: the Peixe Lagoon fisherfolk**

The selected working definition of 'community' for this thesis is similar to the definition provided by Agrawal and Gibson (2001): human groups containing individuals living in the same geographic area, with some characteristics in common which may include status, political and economic power, religion, social prestige, beliefs and intentions. Recent discussions of the term community in the common property literature have pointed out the difficulty of defining a community (Agrawal and Gibson 2001). One person may find that a given group of people is one community while another may divide the same group into two or more communities. Defining a community using the criteria of 'same geographic area' or 'same beliefs' may be problematic. Defining who belongs to a certain community can be seen as relevant within the context of a given study as opposed to something that is an unchangeable attribute of a given group of individuals like the fishers of the Peixe Lagoon.

For the purpose of this thesis I have decided to consider that there are two communities of Peixe Lagoon fishers: one community is made up of the fishers who live in villages located on the beach (Figure 3), while the other is made up of fishers who live in or near urban areas (Table 2). The main reason why I consider these fishers as two groups is due to the fact that they themselves recognize as belonging to different groups. They can also be seen as two distinct groups because of their different sources of income, fishing spots, and interests. In addition to these two communities, there is a group locally called *coqueiros*, unlicensed resource users who fish in the Peixe Lagoon with illegal nets, such as manual drag-nets, and do so including closed periods. This group was not a focus of this research.

The two communities of Peixe Lagoon fishers mentioned above hold a "temporary and exceptional" license given by IBAMA to fish in the Peixe Lagoon

National Park. They have been granted such a licence because the IBAMA is only willing to let them fish until resources are found to relocate them outside the protected area.

***Beach fishers***. The beach community is composed by five villages located inside or bordering the National Park. There are three villages inside the National Park (locally named *Barra*, *Lagamarzinho* and *Talha-Mar*) and two villages outside it (located within the beaches named *Praia do Farol* and *Praia Nova*), which together have ninety-four (94) fishers according to data provided by the local Fishers Labour Union, the Fishing Colony Z11 (Table 3). *Praia Nova*, with fourteen (14) fishers, is the only village located in the rural area of Mostardas municipality.

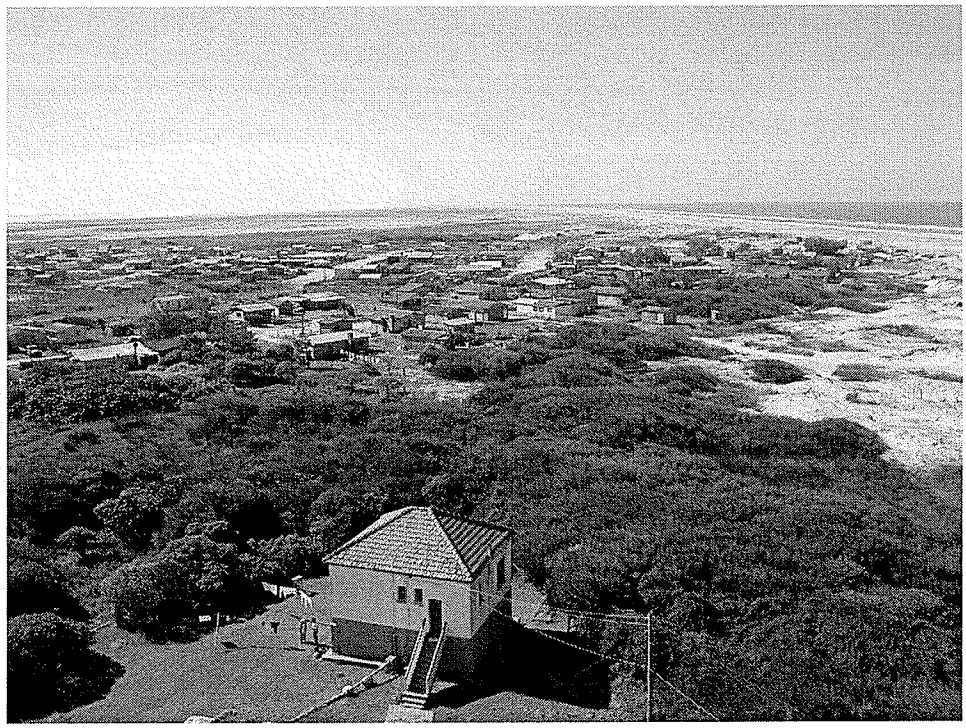

**Figure 3: View of the *Praia do Farol* village**

Twenty-five years ago the villages of *Talha-Mar, Praia do Farol and Praia Nova* did not exist. However, there were at least two other villages at that time. They were named *Vinho* and *Paiva* and were located close to the *Barra* village. After the creation of the National Park, fishers started to move to other villages outside the protected area or close to its edges. The same happened to the people who had houses for vacation. In this way, the villages of *Talha-Mar*, *Farol* and *Praia Nova* were created. Therefore, the

fishers living in those villages come from the same group of families, and in fact they present close kinships.

**Table 2: Number of fishers by residence**

| Community | Village or town | Number of fishers |
|---|---|---|
| Beach fishers (Total = 94 fishers) | Barra | 35 |
| | Lagamarzinho | 5 |
| | Talha-mar | 16 |
| | Praia do Farol | 24 |
| | Praia nova | 14 |
| Urban-based fishers (Total = 72 fishers) | Tavares | 32 |
| | Caporocas | 14 |
| | Capão Comprido | 8 |
| | Mostardas | 18 |
| TOTAL | | 166 |

**Table 3: Number of beach fishers per village according to gender**

| | Barra | Lagamarzinho | Talha-Mar | Praia Farol | Praia Nova | TOTAL |
|---|---|---|---|---|---|---|
| **Men** | 25 | 3 | 15 | 21 | 11 | 75 |
| **Women** | 10 | 2 | 1 | 3 | 3 | 19 |
| Village total | 35 | 5 | 16 | 24 | 14 | **94** |

The villages inside the National Park consists of traditional fishers of the Peixe Lagoon and their families, while in the villages located outside the protected area there are also new fishers coming from other places. While the villages inside the National Park are shrinking, those outside are not only receiving fishers who move out from the protected area but also each time more houses are built for vacationers and tourists.

The beach fishers work both on the beach and in the Peixe Lagoon, and usually do not have other sources of income. They are mostly descendants of Azoreans which arrived in the region in the eighteenth century and Azoreans who migrated from Santa

Catarina State[1] a few decades ago. All the fishers from the other community, i.e. the urban-based fishers, come from families which have inhabited that region for centuries. Beach fishers are allowed by IBAMA to capture pink-shrimps with thirty (30) hoop-nets with wings while urban-based fishers can only use twenty (20) of those nets (Figure 4). The justification provided by IBAMA is that the urban-based fishers have alternative sources of income and therefore can afford fishing with a lower number of nets.

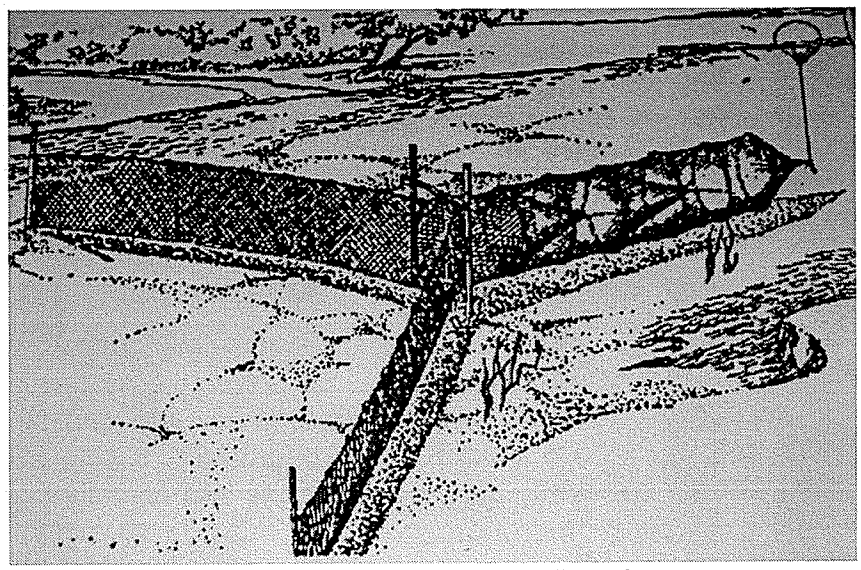

**Figure 4: Hoop-net used in the pink-shrimp fisheries (Source: Dolci 1985)**

***Urban-based fishers.*** Urban-based fishers reside in the municipalities of Tavares and Mostardas and two rural villages considered as part of Tavares (locally named *Capão Comprido* and *Capororocas*). This community is formed by seventy-two (72) fishers and slightly more than 80% of them live in Tavares or in the villages attached to this city (Table 4). Only few of these fishers work on the beach. Most of them fish only in the Peixe Lagoon and complement their income with activities not related to fisheries. The most common alternative sources of income come from agriculture (especially the onion crop, which is traditional from this region) and any kind of part-time job (e.g. carpenter). Some of them are land owners while other work as labourers or harvesters.

[1] Santa Catarina is the second southernmost Brazilian State, north to Rio Grande do Sul State. Santa Catarina is strong in fisheries and is recognized as having skilled and creative fishermen.

**Table 4: Number of urban-based fishers per location according to gender**

| | Tavares city | Mostardas city | Capão Comprido | Capororocas | TOTAL |
|---|---|---|---|---|---|
| **Men** | 29 | 13 | 6 | 18 | 66 |
| **Women** | 3 | 1 | 2 | 0 | 6 |
| Total per residence | 32 | 14 | 8 | 18 | **72** |

Fishers from this community belong to traditional families of the region which used to rely on onion agriculture as the main source of income and on fisheries for subsistence. As the value of onion has steeply decreased during the last decades, these families increasingly rely on fishing for income. Some of these fishers are beach fishers from who moved to the city (these still fish on the beach, and are permitted to fish with 30 hoop-nets). It seems that this group is tending to leave agriculture in favour of concentrating efforts on fishing activities.

A considerable number of fishers from both communities visibly live in a condition of severe poverty. For those living inside the National Park, their houses lack running water, basic sanitation and electricity. Most of them do not have means of transportation and inhabit old houses made of wood. Typically, like other Brazilian small-scale coastal fishers (Diegues 1999), they have a low-income and weak political organization. For those reasons they have historically been socially marginalized and largely ignored by official decision-makers.

According to Garcez and Sanchez-Botero (2005) eighty-nine percent (89 %) of small-scale fishers in Rio Grande do Sul State earn between R$160 and R$1400 per month (CAD $96 and $843)[2]. This income is used to sustain their families which have the average of four people. Low income has been partly due to declining fish stocks, and the unfavourable ways of commerce including lack of value aggregation to products and dependence on selling to few middle-men.

Peixe Lagoon fishers use relatively simple technologies. They place their nets manually and use open boats without an engine locally known as *caícos* (Figure 5). In addition to using simple technologies, fishers from both communities have a number of

[2] According to the exchange rate used by the Central Brazilian Bank on May 9th 2008 (One Brazilian Real equals to 1.66 Canadian Dollars).

similar characteristics when compared to other small-scale fishers from the Brazilian coast. Those characteristics include commercialization of products through middle-men (Diegues 1983), consumption of fish for subsistence, and involvement in fishing activities for at least 20 years (Garcez and Sanchez-Botero 2005).

**Figure 5: Peixe Lagoon fisher navigating in a *caíco***

The culture of Peixe Lagoon fishers have unique characteristics derived from the Azores and adapted to the local conditions. Those characteristics can be seen, for example, in their culinary, way of speaking and religious practices. Their whole culture is also closely related to fishing activities. Fishers from both communities have named different fishing sectors in of the Lagoon according to the name of ancient land owners. Their religious festivals are mostly related to *Nossa Senhora dos Navegantes* and *Iemanjá*, spiritual figures from the oceans related, respectively, to Christian and African religious.

The fishers usually learn about fishing techniques with their parents as they participate in the fisheries from the time they are children. The knowledge related to the

best conditions to capture the different species in the different environments is transmitted orally during daily activities. Woman and children are involved in fishing activities. While many of them participate directly in the fisheries or in clam extraction (Figure 6), others help in post-landing activities such as eviscerating fishes and cleaning boats and nets.

**Figure 6: Fisherwoman collecting clams while babysitting**

### 1.3 Purpose and Objectives

The proposed research take into account the interest conflicts in the Peixe Lagoon National Park, which is causing difficult living conditions in the protected area, threatening not only the survival of the local fisherfolk culture and traditional livelihoods but also the environmental and resources conservation of the Peixe Lagoon. The purpose of this research is to explore the opportunities and difficulties of integrating the traditional fisherfolk in the Peixe Lagoon National Park management plan in a way that balances environmental conservation and local fisherfolk livelihoods.

The specific objectives are:

1. To investigate the community self-organization, local institutions and resource management strategies;

2. To examine the community's own agenda and concerns for the protected area;

3. To explore institutional linkages both at the local level and across levels of organization as related to the management of the protected area.

The objective of investigating community self-organization is related to the recognition that without local organization, leadership and institutions - reflecting some level of social cohesion - fisherfolk are not able to negotiate properly with external institutions for co-managing natural resources. Community self-organization is defined for the purpose of this research as being the capacity of the community to modify its own structure and characteristics in order to deal with the internal and external conditions to which they are exposed (Holling *et al.* 2002, Seixas 2006). An important factor in community self-organization is often the existence of leaders that represent the opinions and wishes of their fellows (Olsson *et al.*, 2004). Self-organizational capacity is also essential to create and enforce local resource management strategies (Berkes 2003).

Along with self-organization it is often necessary for a community to establish interactions and partnerships with other organizations and institutions. Experience has shown that multiple linkages between local institutions and external organizations, such as government and NGOs, strengthen co-management arrangements (Berkes 2002). Horizontal linkages are those that connect analogous organizational level across space (e.g. links among different fisherfolk communities) and vertical linkages are related to the connections among institutions existing at different scales of acting (e.g. local communities and national governments) (Berkes and Seixas 2004).

The objective of examining a community's own agenda is in accordance with a recent draft policy produced by the World Commission on Protected Areas (WCPA) in partnerships with the World Wildlife Fund (WWF) and the International Union for Conservation of Nature (IUCN). This policy is based on the demands of several indigenous' peoples organizations regarding the establishment of protected areas. Among the most important demands are their rights to determine their own priorities and have a stake in the decisions that impact their future (Charity and Masterson 1999).

### 1.4 Methodology

This research was conducted using a qualitative methodology as suggested for exploratory studies (Creswell 2003). This methodology provided ways to gain a wide understanding of different aspects of the studied problem in a relatively limited span of time. The single-case case study strategy was chosen for data collection. This strategy allowed for flexibility in the use of specific methods of information gathering (Creswell 2003).

The methods of investigation consisted in primary data collection, which were complemented by secondary sources of information such as local newspapers and the Management Plan of the National Park. Primary data were collected using semi-structured in-depth interviews (Creswell 1994; Czaja and Bleir 1996) and participant observation (Vieira *et al.* 2005).

Approximately four months was spent in the field, from the beginning of May to the end of August 2007. This amount of time was necessary to create a minimum of familiarity with the informants and local dynamics, in order to accomplish participant observation. The interviews were undertaken with local fisherfolk, current officials of the National Park, and other actors involved in the institutions that influence the management of the protected area (e.g. scientists, local politicians, IBAMA officials in the state and national level). Data triangulation was accomplished in order to check for consistent patterns in the collected information (Creswell 2003).

### 1.5 Justification of Research

There are several arguments in favor of the relevance of the present research. First, this research contributes to the increasing body of knowledge about the factors leading to success or failure in co-management arrangements for environmental conservation. Although co-management is not currently the management approach for the study area this research assessed the factors potentially hindering the development of such a management approach. More specifically, the present research contributes to a better understanding of the social and organizational conditions that leads to successful community-based resources and environmental management.

Second, the research findings have potential for practical application. It provides support for the adequacy of the status of protected area, looking for the establishment of a more legitimate and sound environmental conservation in the Peixe Lagoon region. The research has implications for the defense of fisherfolk rights related to the maintenance of their culture and livelihoods. The rights of traditional resource users are expressed not only in SNUC (Brazil 2004) but also in important international conventions such as Agenda 21 (United Nations 1992).

According to previous studies, the traditional fisherfolk of Peixe Lagoon have a rich traditional ecological knowledge (TEK) and a unique culture. These have been threatened due to the legal requirements of the National Park (Almudi 2005, Diegues 2008). Recent data suggest that in Latin America 86% of the protected areas have human inhabitants (Amend and Amend 1992). The present research contributes to the understanding of conflicts occurring at protected areas, especially in the context of developing countries.

### 1.6 Study Limitations

As the research was accomplished utilizing methods such as participant observation and interviews, there existed the chance of miscommunication or misunderstanding among the researcher and the people being observed and interviewed. In the context of the Peixe Lagoon National Park, this issue may be higher due to the fact that the local population is often under pressure to leave the protected area. They demonstrated certain apprehension in responding to interviews and interacting with an outsider researcher like me of whom they are suspicious as I could be allied to the interests of the National Park administration.

There are clear interest conflicts related to the occupation and use of the Peixe Lagoon. Because of this, both fisherfolk and IBAMA officials may have hidden information that reveals evidence against their interests. For example, fishers are likely to try to put out of sight some failure in dealing with the management of the fisheries. On the other hand IBAMA officials are likely to hide, hypothetically, that enforcement in the protected area is weak resulting in a high level of rule breaking. Moreover, the present

research has the potential to provide support for a change in the status of protected area, which is not in the environmental agency plans and can be seem as a polemic subject.

Another limitation of the present research is that I did not consider other people inside the communities beyond fishers. It will be important to understand the interests and concerns of women, children and elders who do not directly participate in fisheries but still are part of the community. The interests and needs of those groups may be different than those of the fishers themselves, and even, perhaps, in conflict.

In addition to the two communities of fishers, there are other citizens from the study region who own lands inside the National Park area. They are mostly farmers who used to live in the country, raising cattle and planting onion or rice. My research did not include this population because the research objectives were already broad enough, requiring need to concentrate efforts and time.

As the field work was carried out from May to September, some important aspects of the studied issue were not directly observed. Most of the fisheries occur during the summer season, i.e. from December to March. In this season, tourists come to the studied area, and that may change the dynamics of daily life. This factor may contribute to the creation of economic alternatives for the local people. However, it can also result in environmental degradation and rupture of traditional institutions. Some fisher institutions are more active during the summer time, due to a higher fishing effort in this period, and that could not be assessed through participant observation.

In spite of these potential challenges I was able to offset them due to my previous experience in working in the area. I was able to draw upon my previous relationships with both local officials and fishers. Such previous contact facilitated my insertion in the daily life of the community studied and eased communication with the IBAMA staff.

### 1.7 Organization of the Thesis

This thesis is organized into nine chapters. Chapter One introduces the research context and delivers the study's purpose and objectives. Chapter Two provides a literature review that serve as the theoretical basis of the thesis. Chapter Three presents a detailed description of the applied research methodology. Chapter Four then presents community self-organization, touching on issues of cohesion and unity, leadership,

community institutions and resource management strategies. Chapter Five describes the aspirations and concerns of the Peixe Lagoon fishermen communities. Chapter Six examines the institutional interplay that those fishermen have with other communities and organization across the geographical and political scales. Chapter Seven and Chapter Eight discuss respectively the factors that facilitate and the factors that hinder the development of a participatory approach for the Peixe Lagoon National Park. In Chapter Nine a review of the thesis main findings and management recommendations are provided.

# Chapter 2: Literature Review

## 2.1 Participatory Management

Participatory management, in the environmental area, is a general term used to design arrangements in which citizens have a role in the management of a certain area or resource. The conventional 'western' management system based on centralized authority informed by scientific knowledge has often failed to provide right forecasts and corrective measures for environmental problems embedded in complex natural systems (Holling *et al.* 1998, Ludwig 2001). The management of natural systems based on command-and-control, the predominant State approach, has demonstrated to be inefficient as ecological processes are dominated by uncertainty and lack of linearity (Berkes *et al.* 2003). For that reason, there has been growing concern with the creation of management institutions that encompass the local and higher levels of organization, supporting a flow of information and interactions across scales (Carlsson and Berkes 2005).

There is plenty of empirical evidence that neither pure government management nor pure community-based management is the best option to promote successful environmental and resource management. In Brazil, there is an increasing official recognition that traditional communities of resource users and their management strategies are very important to be taken into account when dealing with biodiversity and habitat conservation issues (Pinto da Silva 2004).

Among the main benefits of participatory management is the development of strategies that fit the specific characteristics of the environment and the local cultural and historical context (Tissot 2005). Participatory management allows for avoiding bias from the managers point of view by recognizing the importance of considering local perspectives, knowledge and values for dealing with complex system problems (Lane 2001). Table 5 presents a number of advantages that has been attributed to the participatory management approach and demonstrates how those characteristics are suitable to the Brazilian context of resource and environmental management.

**Table 5: Suitability of participatory management to the Brazilian context**
(Berkes 2002, Kalikoski and Satterfield 2004, Carlsson and Berkes 2005, Jentoft 2005)

| **Advantages of the participatory management approach** | **Brazilian resource and environmental management context** |
|---|---|
| Allows for empowerment of local communities | Local communities of resource users have been typically marginalized |
| Increase transparency in decision-making processes | There exists a historical problem of corruption within environmental agencies |
| Suitable for solving conflicts | Conflicts over the use of natural resources is widespread |
| Incorporate multiple views – Enhance adaptability and flexibility | There are plenty of local resource user communities whose views are relevant for improving management strategies |
| Increase acceptance by local people – higher compliance to regulations | Due to difficult enforcement, compliance with environmental laws has been low |
| Add in capacity and resources by incorporating assistance from local people | Lack of capacity, financial and human resources has been a chronic issue |

Participatory management has been a strategy to achieve a more robust and efficient management by adding in capacity and resources availability and by dividing responsibilities among government and the resource users, who in the last instance decides to obey or disrespect regulations (Jentoft 2005). Environmental and resource management may be improved by including multiple perspectives for problem solving and decision making. Including the view and knowledge of resource user communities is also a fruitful way to enhance management adaptability and flexibility (Carlsson and Berkes 2005).

In the field of protected areas, experience has shown that conservation cannot be imposed despite its consequences for local peoples. Rather, protected area models should be devised in ways that respect peoples' rights and cultural traditions. Based on that, a

new trend on the development of protected areas has emerged. This trend is related to governance decentralization, empowerment of local communities and expanding democratization. In most of countries, such changes have the real potential to expand considerably the areas under environmental protection (Charity and Masterson 1999).

Participatory approaches in natural resource management have the potential to bridge knowledge systems (e.g. local ecological knowledge and scientific knowledge), empower local people, increase adaptation, enhance human capital and promote higher compliance to regulations (Kalikoski and Satterfied 2004, Berkes 2007b, Seixas 2006a). Regarding the increase in compliance to regulations, Pinkerton (1999) affirms that granting a decision-making role to locally based institutions increases not only the suitability of policies and regulations to the local specific context but also increases the community respect for the management strategies commonly agreed.

A participatory and collaborative approach to management can be devised to tackle specific problems in particular circumstances. Government inability for enforcing environmental laws is one common example, as in the Philippines coastal fisheries. Another specific reason for including local communities in resource management is conflict resolution, as documented in a Costa Rican coastal National Park (Berkes 2002).

Carlsson and Berkes (2005) explain that arrangements that integrate the local people in the environmental management have been generally well-considered because of its logical approach that defends the establishment of cooperation to prevent and solve environmental problems. "Participation of the governed in their government is, in theory, the cornerstone of democracy" (Arnstein 1969, p. 216)

Logically, in the real world, the level of participation differs from case to case (Berkes 2002). The levels of citizen participation range from an 'illusory participation' to an effective devolution of power to the community (Arnstein 1969). Pretty (1994) presented a typology of participation in development programs and projects which can be applied to analyze environmental and resource management systems. The implication of this typology is that the term 'participation' can not be applied without the appropriate explanation of what it implies in the practice (Pimbert and Pretty 1997).

According to Pretty (1994), citizen participation can be classified in the following seven different categories: (1) Passive participation: people participate by being informed

about what is going to happen or has already happened; (2) Information giving: people provide information by answering questions posed by researches, but they do not have the opportunity to influence proceedings; (3) Participation by consultation: people's concerns are listened by external agents, but there is no obligation of taking these concerns into account in the final decisions; (4) Participation by material incentive: people participate by providing resources, such as labour (e.g. working as environmental guards), receiving in return some material incentive; (5) Functional participation: citizens form groups to decide objectives to be achieve for common benefits. It usually involves the development of organization initiated and facilitated by external agent; (6) Iterative participation: community groups develop to interact with external groups in joint actions; (7) Self-mobilization: people are well organized and take initiatives independent of external institutions.

Co-management can be seen as the establishment of partnership for resource and/or environmental governance (Carlsson and Berkes 2005). According to Béné and Neiland (2006), governance is the development of policies and the application of the same through management strategies. According to the Lisbon Principles, a sustainable governance (of oceanic and costal areas) is only achieved by full stakeholder participation in formulating and implementing decisions (Seixas and Berkes 2004). Only through a high level of participation most of the benefits that emerge from joint governance can be achieved. Transparency in the decision-making process and higher compliance to management strategies are properties of systems in which people believe their inputs are respected and put into practice (Seixas 2006b).

Co-management is a form of participatory environmental management in which there exists an arrangement of power and responsibility sharing between the State and citizens, generally resource users (Berkes *et al.* 2001). Co-management has been used as a 'catch-all' term for different arrangements, with diverse institutional linkages structure and power-sharing agreements (Figure 7).

Looking at co-management as a matter of collaborative problem-solving, Carlsson and Berkes (2005) argue that power-sharing is not the starting point of co-management but it is the result. This thought focuses on the arrangements' functions, rather than in their formal structures, which should be developed in an adaptive form to fit the specific

conditions of the natural and institutional environment (Carlsson and Berkes 2005). The development of good organizational structures for co-management is a continuous process, which evolves and adapt to changes in a slow pace (Kalikoski *et al.* 2002). That is why co-management arrangements may fluctuates among different levels of participation, hopefully achieving higher participation whereas communities and the government learn to work with each other.

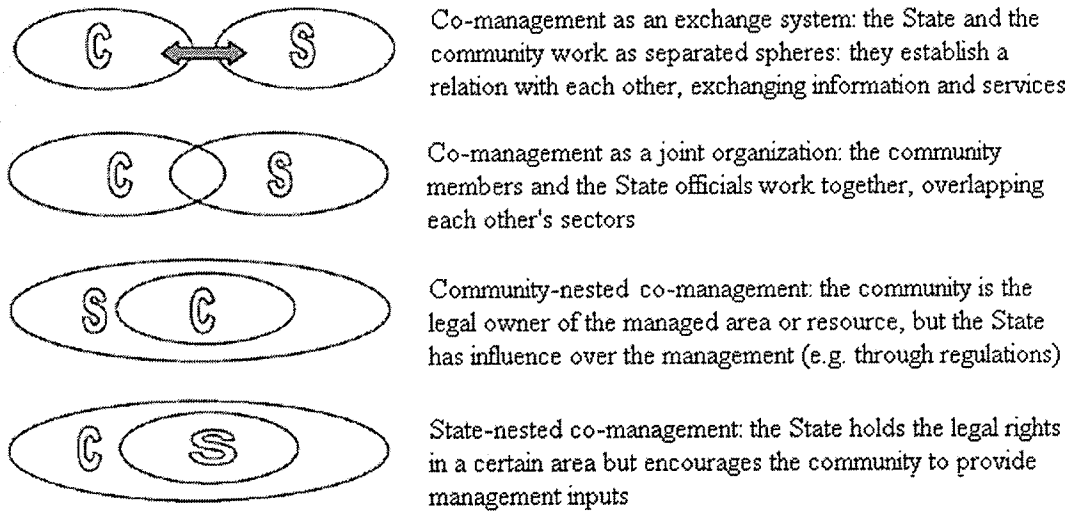


**Figure 7: Types of participatory management that may be termed co-management**
(Adapted from Carlsson and Berkes 2005)

There is a considerable literature with examples around the world of different forms of participatory resource management. Examples of it are small-scale benthic fisheries in Chile (Castilla and Fernandez 1998), caribou management in northern Canada (Kendrick 2003), and forest management in Zimbabwe (Mutimukuru *et al.* 2006). There are also cases of participatory management of whole environments, as happens in the coastal zone of United Kingdom (Edwards *et al.* 1997) and in the Mamirauá Sustainable Development Reserve, located in the Brazilian Amazon (Gilllingham 2001).

Neither State nor community are homogeneous groups, what implies that participatory arrangements must be seem as networks in which each group is formed by different sub-groups and individuals with different interests, perspectives and skills (Berkes 2007b). In most of the real life co-managements, one finds a rich web of relations between different private actors and a set of public actors. The State (composed

by several agencies) or the community (composed by several villages) cannot be seen as monolithic entities (Figure 8) (Carlsson and Berkes 2005).

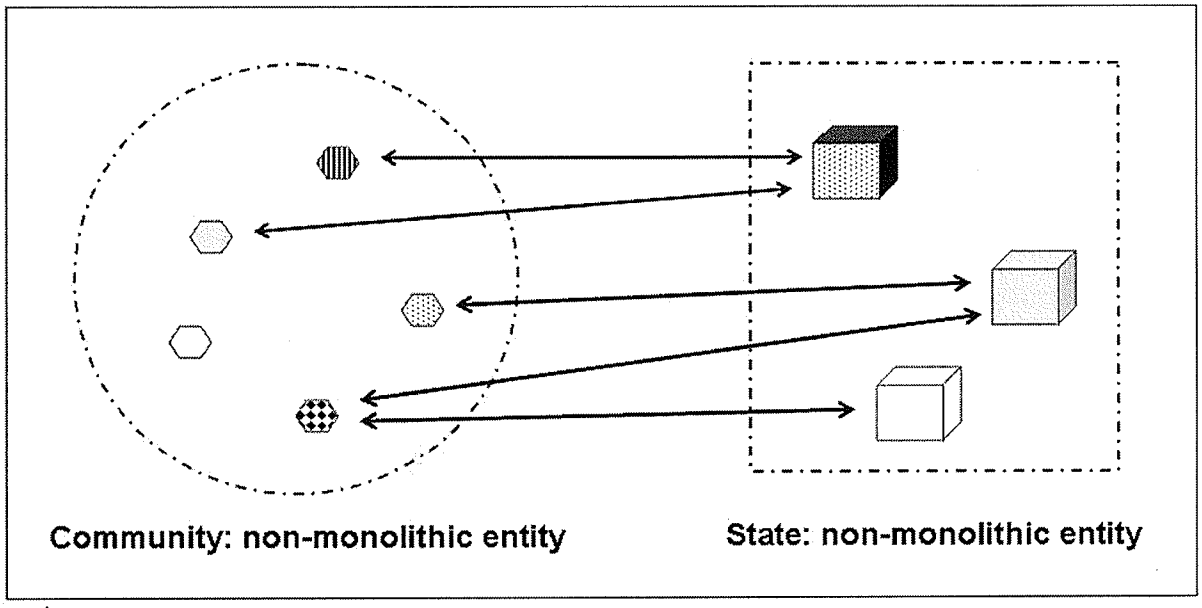


**Figure 8: State and community shown as heterogeneous groups**

Lane and Corbett (2005) identify a number of factors that differentiate groups inside the so-called communities. Among them are gender, ethnicity, social status, age and specific interests. If a society is to be democratic, the more the different sub-groups are equally empowered the better. Otherwise, participatory arrangements which claim to be democratic have the potential to assign power to already powerful actors, perpetuating existing inequalities (Lane and Corbett 2005).

Co-management is a process which involves power-sharing, institutions building, establishment of trust and increasing in social learning and problem-solving skills (Berkes 2007b). These different faces of co-management reflects the way researchers have looked at it in the last two decades, and highlights some of the different aspects of co-management that must be observed (Berkes 2007b).

Power-sharing, leading to equity, is one of the columns that sustain co-management arrangements. Depending on how these arrangements are designed, co-management can perpetuate and intensify existing power imbalances rather than enabling

citizens to take a higher of control over the management of local resources. Effective power-sharing often requires institutions building that facilitates the interactions between resource users and the State agencies. However, such institutions only work through the establishment of reciprocal trust among the different stakeholders participating in the process (Berkes 2007b).

Social learning involves the education of citizens and government officials for cooperative work. It entails learning to respect different opinions and worldviews and learning to establish relationships based on respect and confidence. Social learning is not only a matter of individual learning, but it seems to require some level of collective and institutional learning (Berkes 2007b). Through robust and effective cooperation, co-management arrangements can be more than a decision-making process, which is related to the choices between different alternatives. It can develop to become a problem-solving process in which the stakeholders also think together what these possible alternatives are (Carlsson and Berkes 2005).

There is a discussion about the appropriateness of using the term 'governance' instead of 'management' to better describe the nature of the stakeholders' interactions among each other and with the environment. Carlsson and Berkes (2005) affirm that co-management may be considered a governance system, which is consistent with the principles of good governance, i.e. transparency, accountability and legitimacy based on a democratic process.

Although many scholars use 'governance' and 'management' with the similar or the same meaning, Béné and Neiland (2006) argue there is an important distinction between them. Governance is about planning and creating policies that should guide the process of implementing management actions. Management refers to a more restrict set of actions related to the implementation of (previously chosen) decisions in the day-to-day activities. Roughly, "management is about action, governance is about politics" (Béné and Neiland 2006, p. 10).

"Governance is about sharing responsibility and power; it is about setting the policy agenda" (Béné and Neiland 2006, p. 11). Although the term 'management', in 'co-management' is limited, arrangements for co-management should avoid being restricted only to management activities and advance to become governance systems. Important

here is to emphasize that participatory management does not only mean the joint implementation of resource use and conservation measures, but also the shared role of setting the principles to guide these activities.

## 2.2 Lagoon Management and Institutions in Southern Brazil

### 2.2.1 General characteristics

For the purpose of this literature review, lagoons are considered to be not only ecological environments where human activities may occur, rather they are seem as social-ecological systems (SES) in which the human activities is an integral part of the ecological processes (Berkes and Seixas 2005). Human societies have a great influence on ecological systems such as on salinity and water flow (e.g. by opening-closing lagoon mouth) and on resources dynamics (through harvesting and stocking). Thinking on the management units as SES is important because the social and the ecological dimensions of management systems are inevitably interrelated (Seixas and Berkes 2003). Although these dimensions are often treated separately, when they are examined under a systemic view, there is an improvement in the resource management system (Berkes and Folke 1998).

Contrasting with the biological ecology approach, the view hold in this thesis is that humans are not external to ecosystems. This view considers the delineation between social and ecological systems as artificial and arbitrary. The use of the term social-ecological system referring to the researched Lagoon is intended to emphasize a humans-in-nature concept (Berkes and Folke 1998).

According to Berkes and Seixas (2005) Lagoon ecosystems usually present some common characteristics which are important to be considered when planning for its management. First, they are most of cases highly influenced by human activities. Second, many of the processes happening in Lagoons occur in annual cycles, such as hydrology and resources flow. Third, they are typically disturbance-driven systems and are subject to shocks and directional change. Those characteristics make the conservation of Lagoon systems a typical complex system problem, with issues of scale, uncertainty and multiple stability domains. For this reason, governance of Lagoon social-ecological systems are better developed using a pluralistic approach which is concerned with diverse knowledge and perspectives and with vertical and horizontal interplay among institutions. In other

words, working with Lagoon conservation entails the necessity to be able to deal with multiple objectives (Berkes 2007a).

Southern Brazil lagoons have in common the characteristics of having abundant and diverse flora and fauna, supporting the livelihood of thousands of small-scale fishermen (D'Incao and Reis 2002, Kaliksoki and Vasconcellos 2007, Seixas and Berkes 2004). The most productive area of the lagoon is the estuary, i.e. the zone which the lagoon fresh waters are most of the time mixed with ocean waters (Saggiomo and Bemvenuti 2006). Estuaries are usually characterized by shallow waters with variable salinity, temperature and flow intensity which depends on the climatic and hydrological local conditions. Such variability directly affects the productivity, distribution and availability of fishery resources (Kalikoski and Satterfield 2004, Berkes and Seixas 2005, Kalikoski and Vasconcellos 2007). In fact, uncertainty and variability are key factors to be considered in lagoon management (Berkes and Seixas 2005).

Two small-scale fisheries management systems, in Southern Brazilian lagoons, are well documented: the Patos Lagoon (Reis and D'Incao 2000, D'Incao and Reis 2002, Kalikoski 2002, Kalikoski *et al.* 2002, Kalikoski and Satterfield 2004, Kalikoski and Vasconcellos 2003, 2007), and the Ibiraquera Lagoon (Seixas 2002, Seixas and Berkes 2003, Seixas and Berkes 2004, Seixas and Troutt 2004, Berkes and Seixas 2005, Seixas 2006a).

In both lagoons, the most important species for the fisheries are pink-shrimp (*Farfantepenaeus paulensis* and *Farfantepenaeus brasiliensis*[3]) and mullets (*Mugil platanus*, Mugil spp) (Seixas and Berkes 2004, Kalikoski and Vasconcellos 2003). In the Patos Lagon the catfish (*Netuma barba*) and the croaker (*Micropogonias furnieri*) are also important fisheries (Kalikoski and Vasconcellos 2003). Although in the Patos Lagoon the most part of the fishermen rely exclusively on the fisheries (Kalikoski 2002), few fishers in Ibiraquera Lagoon depend totally on fisheries for their livelihoods (Seixas and Berkes 2004). Ibiraquera Lagoon fishermen have in tourism-related activities their main source of income, achieving a living standard well above the poverty line (Seixas

[3] *Farfantepenaus brasiliensis* is only present in the Ibiraquera Lagoon, while *Farfantepenaues paulensis* is present in both lagoons.

and Berkes 2004) while most of Patos Lagoon fishermen face serious socio-economic restrictions because of the decreasing in the stocks of fish and shrimp (Kalikoski 2002).

### 2.2.2 **Resource management strategies**

Fishery management systems in Southern Brazil lagoons currently present some issues in common such as high number of fishermen, multiple interests for the use of the area, and different sectors of government dealing with the same problems in a not integrated manner (Seixas and Berkes 2004, Kalikoski and Satterfield 2004). In Patos and Ibiraquera Lagoons, the fishermen communities have divergent interests, which also conflicts with the use of the area for tourism and harbour activities. In both cases, different governmental agencies at different political levels establish conflicting policies for the utilization of the lagoons (Kalikoski *et al.* 2002, Seixas and Berkes 2004).

Until the early 1960s, both Ibiraquera and Patos Lagoon experienced successful community-based resources management, with resource abundance, sustainable exploitation rates and few user group conflicts (Seixas and Berkes 2003, Berkes and Seixas 2005, Kaliskoski and Vasconcellos 2007). However, this situation started to change when in 1967 the government adopted policies for the development of the industrial sector and for the centralization of the fisheries management in Brazil (Kalikoski *et al.* 2002).

In that period, government fisheries policy was aimed at economic growth and not concerned with resources conservation (Kalikoski *et al.* 2002) resulting in the permission of new entrants to exploit fisheries resources with high catching capacity, which leaded the fisheries to a considerable decline in the subsequent decades (Kalikoski 2002, Diegues 2008).

In the Patos Lagoon, a Forum for the fisheries co-management was created in 1996, after decades of open-access resources exploitation (Kalikoski 2002). The Patos Lagoon Forum is a multi-stakeholder body integrating 21 institutions, with emphasis on the role of the government and the inputs of local resource users for fisheries management and conflict resolution (Kalikoski *et al.* 2002).

The creation and establishment of this Forum provided conditions for the delegation of decision power to resource users, greater protection of small-scale fisheries

and greater compliance with the established rules (Kalikoski and Satterfield 2004). However, the Forum has presented several limitations such as conflicting institutional arrangements, prejudice against the validity of fishermen knowledge, little participation of fishermen in the Forum meetings, and problems of misrepresentation (Reis and D'Incao 2000, Kalikoski *et al.* 2002, Kalikoski and Satterfield 2004). Legitimate fishermen representation was also an issue identified in the Ibiraquera case, resulting in lack of compliance to the established regulations (Seixas and Berkes 2004).

Despite the problems, the Patos Lagoon Forum has increased legitimacy over time and has achieved significant positive management outcomes such as the restriction of access to outsiders and the definition of fishing calendars according to the fishermen inputs (Kalikoski and Satterfield 2004). The establishment of adequate decentralized arrangements takes time, especially in places with a culture of top-down management approach. The establishment of co-management is not a rapid and easy process, particularly in intricate and variable environments such as lagoon social-ecological systems (Kalikoski and Satterfield 2004, Berkes and Seixas 2005).

In the Ibiraquera Lagoon, local organization allowed for the establishment of a co-management arrangement between 1981 and 1994, replacing the open access regime of resources exploitation (Seixas and Berkes 2003). The presence of a local leader with support of the most of the fishermen and good political relations allowed the resource users to influence the creation of management regulations according to their knowledge and experience. However, a political change leaded the existing arrangement to break down and the fisheries activities returned to be open access, causing depredation of the lagoon system (Seixas and Berkes 2003).

Seixas and Berkes (2004) argued that the creation of a Forum in Ibiraquera Lagoon as platform for shared decision-making (similarly to the case of the Patos Lagoon), would be a worthy initiative towards a more strong and efficient governance of the lagoon resource use. For that, it would be necessary revisit the cross-scale communication system for resources management in place during the 1980s and early 1990s (Seixas and Berkes 2003).

### 2.2.3 **Improving participatory management in lagoon systems**

Participatory environmental and natural resource management has the potential to combine knowledge systems, enable knowledge exchange across scales, empower local people, facilitate adaptation, and increase observance of resource use regulations (Seixas 2006a). This management approach is especially valuable for situations such as in Southern Brazilian lagoons where there exist conflicting interests for different kinds of resource use and conservation. Since the Rio 92 Conference, the idea of participatory management has been incorporated in many government agendas, including countries with history of centralized management strategies such as Brazil (Seixas 2006a).

Berkes and Seixas (2005) investigated five lagoon management systems with the objective of identifying factors leading to resilience building. In addition to the cases of Ibiraquera and Patos Lagoon, they examined Cochin (India), Negombo (Lanka) and Haylazli (Turkey) Lagoons. These authors examined the resource management arrangements recognizing that lagoons are social-ecological systems (Berkes and Folke 1998) in which human activities are a basic part of the lagoon ecology. The main factors found to contribute for enhancing the resilience of lagoon's social-ecological systems were (a) learning to adapt to change and uncertainty, (b) nurturing diversity for reorganization, (c) combining different systems of knowledge and (d) creating opportunity for self-organization.

Fishermen experience, memory and knowledge are an essential input in management systems to build rapid feedback capacity to respond to environmental change and developing coping strategies. In the same way, governmental institutions must nurture space for political experimentation, creating opportunity for learning and adaptation in face of political instability (Seixas and Berkes 2003, Berkes and Seixas 2005).

Diversity and strength of institutions help to build resilience where there is space for interactions and communication among such institutions (Berkes and Seixas 2005). Institutions strength can be measured as the robustness and legitimacy of rules-in-use, enforcement and leadership (Seixas and Berkes 2003). The Forum of Patos Lagoon represents an example in which diversity of institutions (universities, religion

associations, fishermen organizations, government, and others) helps to increase the options of possible management strategies and represents a foundation for innovation in regards to the rules and laws for the use of resources (Kalikoski 2002).

The combination of fishermen knowledge with scientific knowledge make co-management stronger than purely community-based or government resource management (Kalikoski and Vasconcellos 2003), especially in areas where there are scarcity of scientific information (Seixas and Berkes 2004) or where long-term data are not available (Johannes *et al.* 2000). Using fisher's knowledge and scientific knowledge together has improved several lagoon management systems around the world (Johannes 1981, 1998, Kalikoski and Vasconcellos 2007). For instance, Tarawa Lagoon fishermen, in the tiny island nation of Kiribati, are found to have not only the historical knowledge but also the most recent up to date knowledge necessary to save bonefish essential habitats (Johannes *et al.* 2000).

In order to create opportunities for self-organization within the management system, it is necessary that the different institutions involved in the management have the opportunity to keep in constant communication. In addition, they must have motivation to assist each other to achieve a common objective of maintain the resilience of the social-ecological lagoon system (Berkes and Seixas 2005, Seixas 2006a). Resource user self-organization is a key factor in this context. It is necessary that resource users organize themselves around local institutions to develop the ability for cooperative action (Kalikoski *et al.* 2002).

The Cochin Lagoon case demonstrates that self-organization may occur even in the absence of resource rights or government recognition of local institutions (Berkes and Seixas 2005). However, it is important to observe that in Brazil, fisheries management and environmental policies have a history of governance centralization (top-down approach). That entails that government support may be required not only to strength the creation and enforcement of regulations but also to enable the development of fishermen institutions for cooperative management arrangements (Seixas and Berkes 2004, Balint and Mashinya 2006).

As an illustrative example, when the resources exploitation were under a open access regime in the Ibiraquera Lagoon, the local fishers organized themselves into

groups to patrol the lagoon aiming to create constraints for regulation breaking by free-riders. Their activities were ephemeral and fruitless as they lacked resources and authority to punish rules breakers. Illegal practices continued happening, weakening the determination of the well-intentioned fishermen to keep struggling against fisheries over-exploitation (Seixas and Troutt 2004).

## 2.3 Community organization and institutions

### 2.3.1 Community self-organization

Communities are human groups containing individuals living in the same geographic area, with some characteristics in common which may include status, political and economic power, religion, social prestige, beliefs and intentions (Agrawal and Gibson 2001). In the context of environmental and resource governance, **self-organization** is an essential characteristic of resource user communities, allowing for the establishment of strategies for rational resource use, and creating possibility for the defence of the organized group interests. "Self-organization of human institutional patterns establishes the arena for future sustainable opportunities" (Holling 2001, p. 403).

Self-organization is defined as the capacity of a given system (such as a human group or society) to influence its own structure and characteristics (Holling *et al.* 2002). In co-management initiatives, self-organization of stakeholders is one of the key requirements for successful partnership construction (Berkes *et al.* 2001). The local level stakeholders, such as the resource user communities, have been recognized to have an important role in the governance of ecological systems (Diegues 2000).

The existence of formal or informal organizations within resource user communities is essential for the establishment of resource management strategies (Diegues 2008). Management is a set of practices applied for resources use and conservation. Institutions are the set of rules that regulate those practices. Both management practices and institutions are created, maintained and modified by the work of organizations.

Although it may seems that communities are homogeneous groups of people, Carlsson and Berkes (2005) make clear that they should not be considered as monolithic. For example, Kalikoski *et al.* (2002) demonstrate how different groups within the

community of Patos Lagoon small-scale fishermen have divergent interests and believes related to decisions about fishery regulations. Even being diverse, it is important that communities present some level of cohesion and unity. Those concepts refer to the procedures and values hold by people, making them prompt to work together for common benefit (Rudd 2000)

### 2.3.2 **Community leadership**

Leadership within the community is a central factor for self-organization (Olsson *et al.* 2004). Leadership is exercised for key people with the capacity to represent the interests of their societies, building upon existing knowledge and institutions to solve problems (Seixas 2006a).

Leaders are people with a high level of influence and respect within their community. They usually represent the interests of the group under their influence and often set the track for others to follow. For this reason, they frequently act as 'agents of change', a characteristic that has been found to be associated to level of education. Generally, community leaders present a level of education higher than the average people within the community (Seixas 2006a). This education, however, is not necessarily the formal education of school. In many cases community representatives are religious leaders (Seixas 2006a) or people with more experience (Davidson-Hunt and Berkes 2003).

Leaders with great recognition in their communities are likely to have good skills for innovation, communication, team working, learning and broad thinking. They deal with uncertainties and promote coping to changes, communicate and encourage communication among different stakeholders, and think about the problems roots, avoiding symptomatic solutions (Timmer 2004, Seixas 2006a).

### 2.3.3 **Community institutions**

Communities should be examined, in the purpose of understanding their organization, by focusing on their multiple interests and actors and on how these actors influence decision-making. A focus on institutions that shape the decision-making

process is likely to be valuable for those looking for ways of including local people in environmental and resource management (Agrawal and Gibson 1999).

Resource user communities and their leaders organize around formal and informal institutions. Institutional arrangements may often be behind the causes of environmental problems, therefore understanding institutional arrangements and interplay helps to understand and solve these problems (Kalikoski *et al.* 2002). In the establishment of environmental governance partnerships, one of the most important (and sometimes difficult) tasks has been the identification of local institutions prepared to negotiate with external institutions (Colchester 1997).

Institutions are social arrangements to shape and constrain human behaviour and interactions in society. They can be formal (rules and laws) or informal arrangements (norms of behaviour, conventions) that regulate human conduct (North 1994) and diminish uncertainties in social interplay (Berkes *et al.* 2003). The understanding of the role of institutions is fundamental for the understanding of resource management systems (Ostrom *et al.* 1999).

Institutions are evolving social agreements that can change over time in response to external factors or because of challenges imposed by the actions of individuals whose behaviour are institutionally constrained. The interactions or politics through which different actors interact with each other influence the evolution of institutions and the management systems in which they operate (Agrawal and Gibson 1999).

Many of the institutions created by resource users have evolved over long periods of time and as a consequence of extensive efforts for problem solving. These institutions are result of human inventiveness which has led to the establishment of strategies that are tailored to fit local circumstances (Carlsson and Berkes 2005).

An efficient way of enhancing the capacity of management systems to tackle environmental problems is to develop strong institutions in the local level, where individuals directly interact with the physical environment and can modify the rules and norms institutions to better fit them to the specific characteristics of their setting (Kalikoski *et al.* 2002). When local institutions breakdown and traditional leaderships have their role undermined, there is a loss in social-ecological resilience loss, i.e. the

system loses capacity to absorb disturbances and to cope with changes (Seixas and Berkes 2003).

### 2.3.4 **Weaknesses in the local level organization**

Common problems associated with the local level organization are often related to: (a) the lack of ability to organize collectively (Kalikoski and Satterfield 2004), (b) misrepresentation of common interests (Seixas 2004), and (c) the fragility of traditional institutions in face of the changing globalized world (Carlsson and Berkes 2005).

The community ability to organize for collective action has some requirements, which not all groups can achieve (Kalikoski *et al.* 2002). These requirements include the existence of leadership, development of flexible institutions, and political capacity to properly defend their interest in face of external pressures (Brown and Rosendo 1998, Kalikoski and Satterfield 2004). Lack of organization and adequate institutions makes resource users unprepared to engage in participatory management (Seixas 2006b).

Some communities present the problem of misrepresentation of common interests by their representatives. Quite often, community organizations are controlled by local elite that does not represent the interests of the majority of the people they were supposed to stand for (Seixas 2004). For example, at the Forum Lagoa dos Patos (Brazil), fishermen representatives use their position in own benefit (Reis and D'Incao 2000), causing 60% of the fishermen to consider that their interests have been not represented or represented in a poorer degree than expected (Kalikoski and Satterfield 2004).

Balint and Mashinya (2006) observed that institutions formed exclusively by local resource users are usually fragile and require continual external support. "Local users alone can hardly manage most natural resources in the complex contemporary world" (Carlsson and Berkes 2005, p. 71). Much of their fragility is related to many social and economic influences which they have suffered during the past decades, leading to a crash of their traditional organizational structure (Seixas 2004).

### 2.3.5 **Creating opportunities for community organization**

Local communities do not live isolated from influences in the local and broader levels. Their livelihoods depend on the relations with the dominant system (Chamy

2004). In order to maintain a system of resource management which allows for sustainable resource use and livelihoods protection, community institutions often need to associate with external organizations (Diegues 2000).

"Whether people are able to self-organize and manage common-property resources also depends on the broader social setting within which they work. National governments can help or hinder local self-organization" (Ostrom *et al.*1999, p. 281). The government can provide funding and information to support local organizations, and legitimize and facilitate the enforcement of the rules established by local institutions. However, local self-organization can be hindered when governments does not recognize the institutions created by resource users, maintaining the ultimate control under the State power (Ostrom *et al.* 1999).

Jameson *et al.* (2002) have emphasized that the success of co-managed marine protected areas is related to the level of community organization and institutional capacity. However, in many cases communities of resource users are disempowered, marginalized and lack the level of organization necessary to negotiate with external institutions. "Even in apparently successful conservation and development projects, local participatory decision-making institutions are fragile and require continual external support" (Balint and Mashinya 2006, p. 805). For those reasons, capacity-building and empowerment are needed for the construction of solid participatory management arrangements. Similarly, fieldworkers such as government and NGO staff often also need some kind of capacity-building, including training to communicate properly with resource users and preparation to be more open to their knowledge and perspectives (Seixas 2006a).

The term capacity building is usually used to indicate local people being 'educated' by government, NGO or other technical people. However, in most of the cases, both sides have what to learn and what to teach to each other (Seixas 2006a). The objective of capacity building is not to solve specific problems but rather it seeks to enhance the skills and capabilities of the organizations to resolve their own problems (Berkes 2002).

Empowerment refers to increasing the ability of individuals or groups to influence their own lives and society. This is determined by their access to knowledge, political

process and financial, social and natural resources (Ericson 2006). According to O'Riordan (2002), empowerment is not a transparent and clear concept. Many examples have shown that governments are likely to attribute responsibilities to the communities but resist sharing power genuinely, although claiming to do that (Kalikoski and Satterfield 2004).

The fact that communities are rarely coherent and homogeneous units (Agrawal and Gibson 1999) increase the essential role of capacity-building for the well working of participatory environmental governance endeavours (Carlsson and Berkes 2005). The robustness of community self-organization depends on capacity-building that leads to the enhancement of community's social capital and community's ability for conflict management (Berkes and Seixas 2005).

From 24 finalists of the 2004 Equator Prize for successful partnerships involving community in projects of conservation and sustainable use of biodiversity, at least 50 percent of them built had some sort of capacity building for community organization. In these projects, capacity building was related to training provided for "institutional building, financial management, organizational management techniques, board development, team building and community work, leadership skill, youth development and communication skills" (Seixas 2006a, p. 11).

Diegues (2000) explains that local level organization in Brazil has been a result of civil society reorganization, involving the emergence of a large number of social movements which, many times, requires the establishment of alliances with parts of the national and international environmental movement.

Autonomous local movements with no support from larger organizations in Brazil have demonstrated to be most of the times incipient and weak. This is because the government subordinates the local movements under the state control. However, when the local organization obtains support from external partners, they become more able to utilize resources in a sustainable way, for example by increasing protection against environmental aggression coming from large economic interests (Diegues 2000).

The case of the Ceará Reservoir Fisheries Project, in the northeast of the country, is an example of success partnership towards community empowerment and strengthening of citizenship. Project staff promoted fishermen learning and organization,

allowing community members for participation in a committee of reservoir users for water resource co-management (Hartmann and Campelo 1998).

## 2.4. Horizontal and Vertical Institutional Linkages

### 2.4.1 Levels and scales

The fact that the dynamics of environmental processes often occur at multiple scales (Seixas and Berkes 2004) has important consequences for the governance of relationships between humans and the environment (Young 2006). Human organization also occur at different scales and levels (Young 2002a), entailing the necessity for the creation of cross-scale institutions that fit with the scales at which the managed ecosystems function (Berkes 2002).

The terms 'scale' and 'level' are easily confused. Some authors (such as Gibson *et al.* 2000 and Cash *et al.* 2006) have made clear distinctions between them. 'Scale' is defined as the dimensions in which the phenomena happen (spatial, temporal, jurisdictional, organizational), and 'levels' are the units of analysis inside those dimensions. For instance, the levels of the jurisdictional scale can be classified as the local, provincial/state, national and international levels (Cash *et al.* 2006).

Cross-level interactions refer to the relationships occurring among different levels within a scale, whereas cross-scale interactions are related to the cases in which is important to consider more then one scale, for example, the spatial and jurisdictional domains of resource management (Cash *et al.* 2006). In general, scholars talking about scales in environmental management refer not only to scales but also to the levels within them (Young 2006).

While the natural resources and services are generated at multiple scales, the jurisdictional boundaries often do not coincide with ecosystem boundaries (Berkes 2002). The misfit in the scale of management institutions and the scale of the ecosystems has been the cause of failure in many management systems (Folke *et al.* 1998). When management strategies does not match the spatial, temporal or functional scales of ecological processes, overexploitation frequently happen (Kalikoski *et al.* 2002)

Many researchers have emphasized the importance of the spatial scale in which different levels of social organization work for the use and management of natural

resources (Seixas and Berkes 2004, Berkes 2002). In a complementary manner, Young (2006) emphasizes the jurisdictional and political scales affecting the different levels of the spatial scale. Berkes (2002) also highlights the time scale because of the relevance of the speed of both institutional and ecological change, affecting the capacity of adaptation to new circumstances.

As the appropriate level in which environmental issues should be tackled is usually not clear, it is important to address such issues in multiple scales at the same time (Berkes 2002). In fact, cross-scale interactions have become essential in times of globalization (Seixas and Berkes 2003), in which the management of ecological systems is accomplished by several agencies at different political scales (Seixas and Berkes 2004). For environmental governance at multiple-scales to happen, it is necessary that the governance institutions interact with each other, i.e. create cross-scale linkages for the coordination of their activities in order to achieve commonly established goals (Berkes 2002, Seixas and Berkes 2003).

Young (2006) argues that regimes of resource management are dependent on scales in the sense that they are institutional arrangements that should care about adopting "a spatial perspective to make use of a scale whose levels encompass local, regional, sub-national, national, and international arrangements" (p. 2).

### 2.4.2 **Institutional linkages**

Institutional linkages are defined as the institutional "direct interactions through networks to provide information or tangible resources related to the management system" (Adger *et al.* 2004, p. 2). Cross-scale institutional linkages have been the norm for resource management, a trend accentuated by the processes of globalization. Part of the reason is because decisions taking at high political levels unavoidably affect local institutions (for good or bad), especially in the current globalized world (Berkes 2002).

Some linkages occur naturally, as Young (2002b) affirmed: functional interdependencies are facts of life. This kind of interactions occurs when the most part of activities of two or more institutions happen in the geographic area or in the same socioeconomic ground. When the functional interdependencies are positive for both sides, there is no need for creating additional linkages. However, when institutions at

higher political level contradict or undermine less empowered systems of management operating at the local level, there is the necessity of establishing new strategic linkages (Young 2002b).

Institutional interplay happens both at the same level and across levels of social and political organization. Institutional linkages created at the same level of organization but across geographical space are called 'horizontal linkages', and linkages established across levels of organization are called 'vertical linkages' (Young 2002b) (Figure 9). According to this terminology, co-management may be seen as a type of management arrangement containing cross-scale linkages at multiple levels (Berkes 2007b).

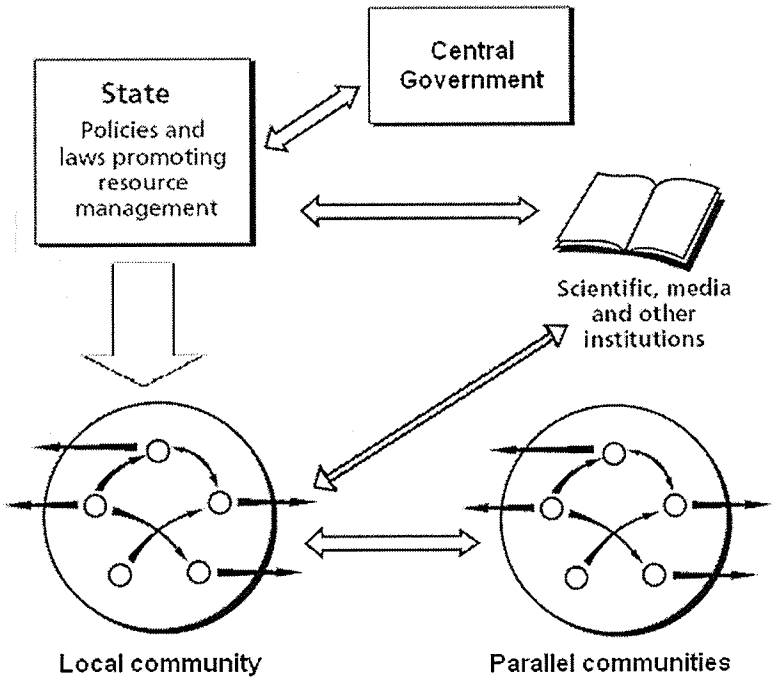


**Figure 9: Horizontal and vertical institutional linkages in resource management**
(Adapted from Adger *et al.* 2004) - The breadth of the arrows indicate the degree of interactions

People at the local level commonly share the same issues and aspirations, creating horizontal linkages between communities and other locally based social groups. In the same way, government sectors often establish horizontal linkages to equivalent agencies or departments (Adger *et al.* 2005). Connections among Nunavut communities, in the

Artic region, is an example of horizontal linkages at the local level leading to joint efforts, in this case related to land rights (Berkes *et al.* 2005).

Vertical linkages tend to have higher transactions costs, since communities seem to communicate easily to other neighbour communities than with international conservation organizations, for example. The institutional objectives and the daily language typically differ among groups at levels of political and social organization (Adger *et al.* 2005). Despite of it, the success of management institutions has been found to be more achievable where interactions exist both in horizontally across the space scale and vertically across levels of organization (Berkes 2002).

Vertical linkages occur in numerous ways as it might involve all combinations of interactions among the local, regional, provincial/state, national, international and respective sublevels of political organization (Berkes 2007b). When there is an increase in the density of institutions operating in the same social space, the chance of interplay among distinct institutions rises (Young 2002b). Berkes *et al.* (2005) provides an example of vertical linkages with the case of management of narwhals, polar bears and persistent organic pollutants in the Canadian Artic, where a multiplicity of vertical connections occurs from the local to the international level.

In an analysis of traditional communities living in Brazilian protected areas, Diegues (2000) identified three kinds of linkages between local organization and higher level actors. The type of linkage determined the extent of advantages the communities obtained from their interactions with external institutions.

The first type of linkage favoured the control of the government over the local resource users. Some protected areas in São Paulo state demonstrated to have a relationship of dominance between the local organization and the park administrations. In the second type of linkage, exemplified by Extractive Reserves, local organization were stronger in their interactions with the government because of their connections to larger social movements. And between these two, some local movements in the Amazon were found to have incipient alliances with NGOs, which provided new opportunities for self-determining initiatives (Diegues 2000).

Cross-scale linkages are created because of the benefits that the involved organizations can extract from co-operation. Nevertheless, Adger *et al.* (2005) suggest

that, although organizations most of the time create and maintain cross-scale linkages to promote their own benefit, self-interest can not always predict the shape of interactions. It is also important to recognize that cross-scale interactions can be positive for both of the sides of the link, but it is not always the case (Young 2002b). The interactions may be established on the basis of the exercise of power, dominance, resistance or co-operation (Adger *et al.* 2004).

Both horizontal and vertical linkages may be established in a formal or informal way. Horizontal interplays at the local level are usually informal while linkages involving higher political levels are more likely to be formal. Legal support and funding are kinds of formal linkages between communities and the government, while informal linkage may be exemplified by unofficial arenas for the information sharing (Seixas 2006a).

Some factors are identified as facilitators of the process of institutional linkage building. Olsson *et al.* (2004) recognized that leadership and the creating trustful relationships are key factors. In this sense, individuals are found be have an important role for the creation of meaningful institutional interplays. Other facilitating factors include the establishment of social networks and arenas for collaborative learning and information/knowledge sharing. In addition cross-scale linkages are more sustainable if there is space for the creation of legislation, ability for monitoring and management experimentation (Adger *et al.* 2005).

The characteristics of the environment under governance also have implications over the design and stability of the cross-scale interactions. "The size of the resources, the physical pressure on exploitation, the cost of enforcement and the static or fugitive nature of resources all play a part in determining the governance structures of collective resources" (Adger *et al.* 2005, p. 5).

As important as the establishment of institutional relationships is the recognition that institutions and their interplays change over time. Even apparently stable institutional arrangements may eventually reach thresholds resulting in considerable changes over short periods (Young 2006). "A particularly potent mix occurs when cascading changes in biophysical systems occur more or less simultaneously with transformative changes in institutional arrangements" (Young 2006, p. 14). In the past two decades the emergence and disappearance of both local level and cross-scale institutions has happened in a fast

pace. For this reason, it is worthy to consider the dynamics of institutional linkages instead of thinking it as static (Berkes 2002).

### 2.4.3 **Importance of institutional linkages**

Arrangements for environmental governance which focus exclusively in one level are risky. One cannot assume that higher-level arrangements will be able to tackle problems which are peculiar to the local level. In the same way, lower-level arrangements most of the time lack the instruments and resources to deal with transboundary issues which affect the local circumstances (Young 2006).

"Purely local-level management and pure higher level management have more limitations than management institutions at more than one level, with attention to interactions across scale form the local level up" (Berkes 2002, p. 294). Higher level is limited because the decision-makers do not live in the place where the use of resources occur (Young 2002b), and local level institutions are limited once local rules are vulnerable to national and international market pressures (Berkes 2002).

Local-level and higher-level organizations have different strengths, being more adequate to deal with different kinds of problems. If they can work together, a higher range of problems are likely to be solved in a synergic way. Advantages of the local level institutions include: capability to detect environmental changes faster (Berkes 2002), presence of local and traditional knowledge which have complementary elements to the scientific knowledge (Berkes 2008), and higher capacity to identify costs and benefits and internalize both (Seixas and Troutt 2004). In addition, local systems are less tied to market systems and have closer relations with the land, having more concerns with the sustainability of local activities and the quality of the environment over the long term (Young 2002b).

Higher-level institutions have a broader range of influence. They inevitably interfere for the development or decline of the local institutions. National and international arrangements are essential, for example, for the governance of migratory resources and human activities taking place in large ecosystems (Young 2002b). "Moving to higher levels of social organization can open up opportunities for increased efficiency

in the use of resources and for more comprehensive approaches to equity" (Young 2002b, p. 283).

A key question is which functions should be dealt at the local level and which are better to be handled by the national government (Kalikoski *et al.* 2002). It is important to allocate specific tasks to the appropriate level of social organization and adopt measures to guarantee that the institutional interplay produce co-operative instead of conflicting actions (Young 2002b). Institutional linkages are important for the creation of feedbacks among institutions at different levels, allowing for collaboration (Berkes 2002).

There is crescent evidence that supports that cross-scale systems are more successful at "(1) assessing problems and (2) finding solutions that are more politically and ecologically sustainable" (Cash *et al.* 2006, p. 9). Institutional linkage building are also important for the empowerment of local user groups, strengthen their possibilities to protect the environment they depend on and increasing their recognition of rules created in higher levels (Adger *et at.* 2005).

Berkes (*in press*) argues that a practical significance of cross-scale linkages and multi-level governance is that they facilitate the creation of learning networks, which is important for building adaptive capacity and increasing resilience. "Social networks that connect institutions and organizations across levels and scales... facilitate information flows, identify knowledge gaps, and create nodes of expertise of significance for ecosystem management" (Olsson *et al.* 2004). Linkages help social groups to handle stress resulting from social, political and environmental changes (Berkes 2002).

### 2.4.4 **Challenges for establishing linkages**

The society has some fundamental challenges in its task of environmental governance, such as (1) to recognize the important scale and level interactions, (2) to identify the existing mismatches between levels and scales of social-ecological systems (Cash *et al.* 2006), and (3) to devise the correct institutional linkages which allow for collaboration instead of competition (Adger *et al.* 2005).

These tasks are not easily achievable, what can be noted by the fact that "there is a long history of disappointments in policy, management, and assessment arising from

the failure to take into proper account the scale and cross-scale dynamics in human-environment systems" (Cash *et al.* 2006, p. 1).

Institutional linkages are not always positive relationships for all the parts (Berkes 2002). Higher-level institutions may produce positive or negative impacts on local level institutions (Table 6). Many times, powerful and non-resident players have a dominant position in the interplays, undermining the institutions created by the resident resource users. Regimes organized by national governments usually favour the stakeholder with more economic and political influence, who does not have ties to the managed land, who move their companies as soon as the resources are finish (Young 2002b).

In other cases of inappropriate cross-scale interactions, governments delegate responsibility to communities without devolving rights and without helping the local organizations in their new duties. Governments incompetent to address environmental problems may see in the popularity of community-based management an opportunity to transfer to the local level the blame for ineffective control of the human impacts over the natural systems. In such cases cross-scale interactions take the place of good governance instead of contributing to it (Adger *et al.* 2005).

Cross-scale interactions devised by powerful players have the potential to undermine the trust between different stakeholders. It happens for example when governments monopolize information and resource, disempowering lower level players (Adger *et al.* 2006). Most of times, regional or national regimes prioritize western scientific knowledge in detriment of the local empirical knowledge, causing impressions of dominance over the local system and few consideration for its contributions. In such situations we can expect problems of credibility and legitimacy (Young 2006).

Young (2002a) explains that linkages among institutions at different levels may be symmetrical (reciprocal) or unidirectional. Symmetrical linkages are those in which both sides have fairly the same exchange of benefits and burdens while unidirectional linkages establish the supremacy of one part over the others. In fact, institutional interplays frequently take the form of 'asymmetric' or 'unbalanced' relationships (Cash *et al.* 2006). That is "benefits from emerging and dynamic linkages are often uneven, often reinforcing existing inequalities" (Adger *et al.* 2005). Thus, the creation of cross-

scale linkages may lead to perpetuation of injustices instead of establishing more fair conditions (Berkes 2002).

**Table 6: Impacts of higher-level institutions on local institutions**
(Adapted from Berkes 2002)

| **Positive Impacts** | **Examples** |
|---|---|
| State legitimization of local institutions | If resource users have the rights to devise their own institutions without being challenged by authorities, they can enforce the rules themselves |
| Decolonization and revitalization | Broader social and political action to overthrow colonization, in form and ideology. It often goes together with movements of empowerment, cultural rediscovery and revival of local institutions |
| Capacity-building | Efforts needed to nurture, enhance and utilize the skills and capabilities of people at all levels. It seeks to develop the capacity of communities, governments and other organizations to resolve their own problems |
| **Negative Impacts** | **Examples** |
| Centralization of decision-making | The former Soviet Union centralized decision-making for rational resource management and for getting production targets, sweeping away in the process, local management systems and institutions such as the *artels* of the Ural Cossaks |
| Increased participation in markets | To take advantage of the demand for prawns in the international market, the government subsidized trawlers in Kerala (India), in an area previously dominated by local small-scale boats |
| Development policies | State policies for development of wheat agriculture in lands occupied and used by pastoralists, in Tanzania, supported by international agencies, resulted in the destruction of local institutions for sustainable use |

### 2.4.5 **Improving horizontal and vertical linkages**

The bottom line for the development of meaningful cross-scale linkages is the recognition that such linkages should not undermine the role and the contributions of

each stakeholder. These arrangements should consciously ensure that the rights and interests of the less empowered stakeholders be recognized (Young 2002b).

One of the most important roles of cross-institutional linkages is to facilitate the exchange of information and resources, promoting mutual assistance among different stakeholders (Berkes 2002). While national governments most of times defend interests of powerful stakeholders, there are many examples of mechanisms and processes through which higher level institutions can deliberatively favour those in local level: recognition and support of local institutions, capacity building, institution building, and development projects (Young 2002b).

The establishment of multiple linkages to complement the relations between the local level and the State is alternative towards creating more balanced interplays. Multi-stakeholder bodies are suitable for this propose as "Characteristically they link multiple user groups and interests, local and regional, with the government, and provide a forum for conflict resolution and negotiation among users" (Berkes 2002, p. 304). Such arrangements allow for diverse vertical linkages between the local level and several agencies within the government, according to the necessity (Berkes 2002).

The establishment of partnership at multiple levels strengths the regimes of environmental governance where multiple interests and power imbalances exists (Kalikoski *et al.* 2002). In spite of the fact that arrangements involving a diversity of both horizontal and vertical linkages are difficult to accomplish, they are no less than necessary (Kalikoski and Satterfield 2004). For example, a wide range of environmental and other NGOs were involved in the implementation of extractive reserves in the Brazilian Amazon. The NGOs, assisted by international funding, provided technical advice and training to improve institutional capacity and access to larger networks of support for the reserves (Brown and Rosendo 2000).

Most of the cases, local institutions do not have the ability and resources to work with the governments and high level agencies are not used to work in partnership with local institutions. For this reason, capacity-building for cross-scale co-operative work is necessary both for the communities and government officials (Berkes 2007b). Capacity-building is essential in the beginning of partnerships, to prepare fieldworks (government and NGO staff, scientists) and local people for collaborative work (Seixas 2006b).

# Chapter 3: Methods

## 3.1 Introduction

Recognizing that the scope of this research was fairly broad to be achieved through quantitative research in a timely manner, and considering that the studied issue had not been explored by previous researches, qualitative paradigm was chosen to achieve the thesis objectives.

Qualitative research can be defined as "any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification" (Strauss and Corbin 1990, p. 17). This kind of research is used to understand phenomena in context-specific settings, where the researcher attempts not to manipulate or influence the phenomenon of interest (Golafshani 2003). However, understanding that the presence of the researcher is likely to change the 'natural flowing' of the observed phenomena, it is important to recognize what are the limitations of the role of qualitative researchers in each specific study.

The qualitative methodology was chosen for the development of the present research because of its exploratory character. This methodology provides a way to gain a deep understanding of a broad range of aspects related to the studied problem in a relatively limited timeline (Creswell 2003). This research fitted the qualitative paradigm as it took place in the natural setting, where the studied phenomena naturally occur. It was based on a systemic view, i.e. looking at the phenomena and behaviours as being complex and iterative (Creswell 2003).

Flexibility in data collection was one of the advantages of using qualitative approaches, allowing the adjustment of the research methods according to the research progresses (Silbey 2004). Contrasting with quantitative researchers who search for causal determination, forecasts and findings generalization, qualitative researchers try to find clarification, understanding, and extrapolation to analogous situations (Golafshani 2003).

Considering that a specific issue in a particular context was to be studied, that is, the self-organization and institutional cross-scale linkages of the Peixe Lagoon fisherfolk, I considered appropriate the use of case-study strategy, as a single case. This strategy is characterized by the use of diverse methods and multiple data collection strategies based

on specific local characteristics, opportunities and problems found during the research (Creswell 1998).

According to Berg (1989), case studies may be classified as instrumental, collective or intrinsic, depending on the purpose of the research. Instrumental case studies are accomplished to try to prove or disprove a specific theory, such as transformative learning theory. The collective case studies are simply the accomplishment of many instrumental cases. In intrinsic case studies, as in the present research, the researcher wants to explore a particular case only because of its interesting intrinsic aspects, which may be related either to exceptionality or ordinariness.

### 3.2 Specific Methods

Primary and secondary sources of data were explored. The primary data collection was done through semi-structured interviews (Creswell 1994, Czaja and Bleir 1996) and participant observation (Vieira *et al.* 2005), while the secondary data collection was collected through document analysis.

Semi-structured interviews were done with local fisherfolk, current officials of the National Park and other institutional officials involved in the studied conflict. Participant observation was done through my involvement in the daily activities of the fisherfolk and as much as possible with institutions related to the National Park.

The primary data were complemented by document analysis (secondary data), such as local newspapers and the Management Plan of the Peixe Lagoon National Park. Such documents provided information about the historic conflict between local population and the Brazilian Environmental Agency (locally called IBAMA) and the measures that have been adopted to solve this conflict.

#### 3.2.1 **Participant observation**

Participant observation consists of direct research observations in the natural setting of the place of study, where intensive interaction between the researcher and the subjects will take place (Vieira *et al.* 2005). It is an attempt to capture worldviews from the studied people, considering the assumption that what they say is also product of how they interpret the world. Participant observation allows for the understanding of social

practices that can not be achieved in other ways (Bernard 1988). It also facilitates the collection of data by other means, such as interviews, because it makes the researcher to be closer to the researched community. It reduces the problem of reactivity, that is, people acting differently because of the presence of an outsider. Further, it allows for validation of the collected information (Bernard 1988).

A limitation of participant observation is that it requires the researcher to spend a lot of time in the natural setting of study, interacting with the studied groups of people. For this reason, this research was done while I was in the field during four months, from May to September 2007. This amount of time was necessary to create familiarity with the informants and local dynamics, in order to collect meaningful data through participant observation. The insertion of the researcher in the community was facilitated by two factors. First, there was no major language barrier. i.e., I speak the same language as the Peixe Lagoon fishers. Second, I had already an experience with work in that area and could re-establish contacts with local people.

Entering the field, I spent the first couple of weeks getting used to the community and allowing the community to get used to my presence. The objective was to make people go about their business as usual when I come around. Participating in social events, such as soccer games, was a strategy to get closer to the fishing community members. After the initial contacts and a period of familiarization to the natural setting and local people, I was able to start explaining the objectives of my work individually and identifying possible interviewees.

At the beginning, a considerable number of community members demonstrated to be suspicious about my work. Later on, I was told by them that they suspected I could be working for the National Park administration. Some factors were important to make them get rid of that impression. One of them was the establishment of closer rapport with some fishers. That allowed the other community members to get less worried about possible negative effects of my work. The fact that I speak the same language and I am used to their specific vocabulary was also important to make me able to explain properly what my research was about.

In addition, after the first month in the field I could not help realizing that the community lacked basic knowledge about the legal requirement for their withdrawal

from the protected area, and about their rights related to it. For this reason I arranged two meetings (at the *Praia do Farol* and Tavares city) for presenting information and discussing this subject with them. Several and diverse members of the community attended the meetings – especially the one in Tavares city. That experience allowed them to have a better idea about what my research objectives were and where they were coming from.

After those meetings I found that the approach to interviewees became easier. It could also be because of personal communication among fishers. After I carried out a number of interviews, the interviewed fishers informally talked about it with the other community members, making them more comfortable with my presence. In the last month of field work I was surprised with the receptivity of the fishers I approach for interview, and with the fact that some of them were already familiar with the work I was doing.

Data gathering through participant observation occurred during the whole period of field work. It consisted mainly on direct observations of the activities of the fisherfolk, National Park staff and other institutional officials. In order to maximize my interactions with the local community one bedroom was rented in the *Praia do Farol* village and a house was rented in Tavares city. Although the National Park headquarters are located in Mostardas city, living in Tavares allowed me to stay closer to both the urban-based and beach fishers. In addition, the fishing labour union Z11, the Peixe Lagoon Fishing Forum and EMATER (Institute for Technical Assistance and Rural Extension) headquarters are located in Tavares. All of those organizations have an active role in the Peixe Lagoon fishing communities. I was able to keep in contact with the staff from these organizations several days a week, keeping track of their activities. As long as participant observation took place, field notes were taken to register the impressions of the events and experiences. That helped me to shape the questions of the interviews in order to explain information that was not clear.

Still as part of the participant observation method I attended meetings of multi-stakeholder bodies and social events with the community. One of those events was a meeting of the Advisory Council of the National Park which took place in August 23rd 2007 in Mostardas city with more than 300 attendants. That meeting was required by the

local councillors to discuss the extension of the National Park buffer zone. One of the strongest impressions from the meeting was the background of tension in which discussions took place. Most of time the local population and their representatives attacked the National Park administration, blaming them for the damages caused to their sources of income. The National Park staff tried to defend themselves citing legal requirements.

### 3.2.2 **Interviews**

Asking questions has being the most accepted and cost-efficient manner of gathering data, representing the keystone of the current social researches (Foddy 1993). Interviewing is an appropriate way to get information difficult or impossible to get through observation, such as past events. Asking explanatory questions is fundamental to complement data generated through participant observation (Hammersley and Atkinson 1994).

After the first phase of acclimatization to the natural setting, and based on the experience accumulated through participant observation, I was able to select informants to participate in interviews. Three groups were interviewed: urban-based fishers, beach fishers and officials from organizations related to the National Park or to the fishing communities. Informal conversations with such stakeholders also contributed very much for my understanding of the context of the researched issues.

As the objectives of this research are to investigate community self-organization and cross-scale linkages, I selected for interview community leaders, elders, and fishermen participating in organizations which require fisherfolk representatives (e.g. Peixe Lagoon Fishing Forum and Advisory Council of the National Park). Through the snowball technique (Creswell 1994) other people within the community were contacted and interviewed as well.

At my first contact with possible interviewees I presented myself and the objectives of my work, clarifying that I was an independent researcher not related to the National Park. At subsequent contacts I invited the fishers who were receptive to me and those with important roles in their communities to be interviewed. The same process was done in regards to institutional officials. All interviews were voluntary, without monetary

compensations for participation. An informed consent was presented orally to fishers and in a written form to institutional officials before each interview was carried out.

In regards to the beach fishers, I had the opportunity to visit all of the fishing villages and to carry out informal conversations with their elders and representatives. However, due to difficult weather and road conditions and lack of means of transportation, I focused my attention on the fishers from *Praia do Farol* and *Barra* villages for the interviews. The interviews consisted on the application of a semi-structured questionnaire composed by an interview guide and a quantitative questionnaire (Appendices 1 and 2). The interviews with fishers were accomplished in informal settings, adapting to the situation in the field and making fishers more comfortable. Government and other institutional staff were interviewed in more formal settings with a more strict vocabulary.

All of the interviews were recorded in a digital voice recorder, with the exception of one fisher who opted otherwise. Interview recording allows for (1) the interviewer to be more thoughtful during the process of making questions (without concerns of making notes), (2) ensuring that all information provided by the interviewee is captured, and (3) quoting directly the informants.

Nineteen beach fishers (around 20% of the group) were interviewed about all the questions of the semi-structured questionnaire. Additional six fishers were interviewed about the quantitative part of the questionnaire, i.e. the part related to aspirations and concerns (Table 7). Eleven urban-based fishers (around 15% of the group) were also interviewed (Table 8). The length of interviews varied from approximately one hour to one hour and forty-five minutes. Real names were substituted by numbers to protect the interviewees' anonymity.

In addition to fishers, ten officials from several institutions related to the National Park management issues and to the fishing communities were interviewed (Table 9). Most of those interviews lasted between one and one and a half hour. The names of the interviewees were not revealed to protect their anonymity. A brief description of the organizations which the interviewees are associated to is presented as follows:

**Table 7: Beach fishers interviewed**

| Fisher no. | Village | Details |
|---|---|---|
| 1 | Praia do Farol | No comment |
| 2 | Praia do Farol | Oldest village fisher |
| 3 | Praia do Farol | Has lost access right |
| 4 | Praia do Farol | Has lost access right |
| 5 | Praia do Farol | No comment |
| 6 | Praia do Farol | Leadership role |
| 7 | Praia do Farol | No comment |
| 8 | Praia do Farol | No comment |
| 9 | Praia do Farol | No comment |
| 10 | Praia do Farol | No comment |
| 11 | Praia do Farol | No comment |
| 12 | Praia do Farol | No comment |
| 13 | Praia do Farol | No comment |
| 14 | Praia do Farol | Leadership role |
| 15 | Praia do Farol | No comment |
| 16 | Barra | Leadership role |
| 17 | Barra | Leadership role |
| 18 | Barra | No comment |
| 19 | Barra | No comment |
| 20 | Barra | Only about priorities |
| 21 | Farol | Only about priorities |
| 22 | Barra | Only about priorities |
| 23 | Barra | Only about priorities |
| 24 | Barra | Only about priorities |
| 25 | Barra | Only about priorities |

**Table 8: Urban-based fishers interviewed**

| Fisher no. | Locality | Details |
|---|---|---|
| 26 | Tavares city | Leadership role |
| 27 | Tavares city | No comment |
| 28 | Tavares city | No comment |
| 29 | Tavares city | No comment |
| 30 | Tavares city | No comment |
| 31 | Tavares city | No comment |
| 32 | Tavares city | No comment |
| 33 | Tavares city | Leadership role |
| 34 | Tavares city | No comment |
| 35 | Tavares city | No comment |
| 36 | Caporocas | Leadership role |

(1) **Association of the Praia Nova fishers**: this association has around 100 associates from the Praia Nova village. Only twelve of them are Peixe Lagoon fishers. It was created to steward a fish storage house with the objective to help fishers to be able to access better commercialization opportunities.

(2) **Association of the National Park land owners**: this association has around 400 associates who are owners of lands inside the area of the National Park.

(3) **Association of the Artisanal fishers from Tavares**: locally know as APAT, this association was formed with the assistance from EMATER. It has a fishing store and packaging house which is still not working. It has around 80 associates.

(4) **EMATER**: this is an agency which is partly governmental and partly private. Its role is to provide technical assistance for rural communities, including small-scale fishers.

(5) **Peixe Lagoon Fishing Forum**: advisory multi-stakeholder body in which different institutions have the opportunity to discuss issues related to the fisheries in the Peixe Lagoon.

(6) **Instituto Chico Mendes**: governmental environmental agency responsible for the creation, establishment, enforcement and management of protected areas.

(7) **IBAMA**: governmental environmental agency which had the attributions of Instituto Chico Mendes until 2007. Today, the attributions of this agency are related to environmental licensing and enforcement outside protected areas.

(8) **Fishing Labour Union (*Colônia de Pescadores Z11*)**: in the Brazilian coast there are several fishing labour unions which are known as Colônias de Pescadores (literally Fisher Colonies). Fishing Colony Z11 is the organization in which fishers from the middle part of the Rio Grande do Sul State coast must be registered in order to be legalized fishers.

**Table 9: Institutional officials interviewed**

| Interviewee | Organization | English translation |
|---|---|---|
| 1 - Association President | Associação dos Pescadores da Praia Nova | Association of the Praia Nova fishers |
| 2 - Association President | Associação dos Proprietários de Terra da Área do Parque Nacional da Lagoa do Peixe | Association of the Land Owners of the Peixe Lagoon National Park |
| 3 - Association President | Associção dos Pescadores Artesanais de Tavares | Association of the Artisanal Fishers from Tavares |
| 4 – Official responsible for fisheries | EMATER (Empresa de Assistência Técnica e Extensão Rural) | EMATER (Agency for Technical Assistance and Rural Extension) |
| 5 – Forum President | Fórum da Pesca da Lagoa do Peixe | Peixe Lagoon Fishing Forum |
| 6 – Official responsible for fisheries at the PLNP | Instituto Chico Mendes de Conservação da Biodiversidade | Chico Mendes Institute of Biodiversity Conservation |
| 7 – Fisheries supervisor | IBAMA (Escritório Federal) | IBAMA (Federal Level) |
| 8 – Mostardas Councillor | Fórum da Pesca da Lagoa do Peixe | Peixe Lagoon Fishing Forum |
| 9 – National Park superintendent | Instituto Chico Mendes | Chico Mendes Institute |
| 10 – Labour Union President | Colônia de Pescadores Z11 | Fishing Labour Union Z11 |

### 3.3 Data Validity

Validation of data occurred throughout the process of data gathering but it was done in a more focused way during the last month in the field, after the data collection reached an advanced stage. Data triangulation (Creswell 2003) was carried out to check for consistent patterns in the collected information, i.e. the available data were validated through comparisons among the information provided by the different primary and secondary sources consulted. This strategy was used to minimize bias of favouring one view despite of others, and to make sure that the information collected were analyzed from a wide range of angles (Ericson 2006).

In order to determine if the research findings were accurate, I decided to spend prolonged time in the field to develop an in-depth understanding of the main issues and phenomena studied (Creswell 2003). Verification of the findings accuracy also occurred

through member-checking, i.e. the results were discussed informally with individual informants, and through a focus group meeting. The process ended as soon as doubts were clarified and at the point that new informants just repeated what had already been said previously by others.

The focus group meeting above mentioned took place at the *Praia do Farol* village on September 14th 2007. Five key informants were selected to participate in the meeting. They were chosen based on the level of rapport I was able to establish with them, and also according to their roles within the community. After an initial exposition of the main preliminary research findings, the participants of the meeting were asked to provide their impressions, especially in what concerns the veracity and accuracy of those findings. Following that, I presented some questions for discussion on subjects I still had doubts about. At the end, the participants also made questions, which were mostly related to the real possibilities of my research to bring concrete benefits for them.

### 3.4 Data Analysis

In order to find results and drive conclusions from the research, all data were brought together for comparison and checking of consistent patterns. A critical analyze of the collected data was done, searching for information that answers the research questions and satisfy the pre-determined purpose and objectives of the research.

Data analysis was done according to the following steps. Those steps were proposed by Creswell (2003), specifically to be used for qualitative data analysis:

(1) Organization and preparation of the data: organization of the data in an easily accessible format, optically scanning the material, reviewing field notes and arranging the data by source of information.

(2) Read through all the data: it is a step to obtain a general sense of the data and to reflect on its general meanings. The researcher starts to reflect on the first impressions about possible findings in this phase.

(3) Detailed analysis with a coding process: it involves continual reflection about the data and organization of the material into 'chunks' before giving meaning to data. In the case of this thesis, data were organized in chunks related to the thesis objectives.

(4) Description: using the coding process to generate descriptions of the community, the natural setting, or other themes related to the studied issue.

(5) Representation: in this step the researcher bring the different descriptions together, make co-relations and work on the ways of representing the findings, which may involve narratives, figures and tables.
(6) Interpretation: the researcher draws the learned lessons, gives meaning to the data, and drives general and specific conclusions.

### 3.5 Ethics Review

The University of Manitoba Policy #1406, entitled "The Ethics of Research Involving Human Subjects", ensures respect for principles of ethical treatment of humans, and requires that all research taken under the auspices of the University involving human subjects must be reviewed and approved y a Research Ethics Board View. In order to comply with this Policy, I completed a required "Human Subject Research Ethics Protocol Submission Form" and submit to the Ethics Board for review. After a round of questions for clarification, the Joint-Faculty Research Ethics Board (JFREB) granted an approval certificate – Protocol #J2007:070.

# Chapter 4: Community Self-Organization

This chapter is concerned with the description and analysis of community self-organization, local institutions and resources management strategies in use at the Peixe Lagoon region. It includes an analysis on the level of cohesion and unity existing among fishers, the values and worldviews behind their behaviours, and how leadership and representation has taken place within the communities. The implications of the current level of organization and cohesion for sustainability are also discussed.

## 4.1 Cohesion and Unity

Fishers are virtually unanimous in affirming that they lack cohesion and unity as a group. It makes them vulnerable to changes in the social-ecological system which they make part, lacking capacity to negotiate with the National Park administration for defending their rights and interests. This lack of cohesion is not the case in many other Brazilian communities of resource users (Box 1). Divergent opinions and lack of attentiveness for assisting each other has occurred at least in three levels, the individual, the family and the community. At the individual level, most fishers defend their self-interests and rarely try to solve problems together with others who are in the same situation. Those self-interests are usually related to accessing opportunities for increasing income. It is not to say that fishers are not able to work together or express generosity. In fact, contrasting industrial fishing enterprises, small-scale fishers from Peixe Lagoon use to share their harvests with unemployed people, neighbours and others in their community. Nevertheless, when it comes for planning and executing actions for improving their condition as a group, they have showed apathy.

At the family level, one can find that there exist a relatively small number of families in each community. Among the beach fishers, for example, almost all fishers would have some kinship with the four or five biggest families. Work related to fishing is usually divided among family members, including women and children (Figure 10). They may participate in the fishing itself or only in post-landing activities such as cleaning fishes, preparing shrimps to be commercialized and fixing nets. The urban-based community is also characterized by few major families; most of them are related to beach fishers. In addition, urban-based and beach families have a long history of living in the

same region, with the result that they know one another quite well. Nevertheless family connections have not created a homogeneous group, in the sense of combining interests and overcoming lack of trust.

**Box 1: Social movements in communities living in protected areas in Brazil**

The social movements of traditional communities living in Brazilian protected areas can be classified in three categories: (1) spontaneous local movements, (2) local movements with incipient alliances, and (3) local movements linked to larger social movements. The first category is formed by social movements of resistance at the local level with the objective of defending their traditional territories. An example of spontaneous movement is the *ribeirinho* fisher communities in the Amazon, who have established local institutions for protecting the lakes which became threatened by commercial urban-based fishers. The second category can be exemplified by isolated traditional communities of the Amazon which established linkages with NGOs and research institutes. Those communities have reached quite good results in pressuring administrations of protected areas to negotiate alternative ways of conserving resources without disregarding the necessities of local peoples. The third category is formed by communities which have developed sound organizational skills at the local level and established partnerships at several political levels. An example of it is the National Council of Rubber-Tappers, a social movement which gained international recognition for negotiating the creation of a new status of protected area – the Extractive Reserves - for the defence of their territories from deforestation caused by illegal trespassers locally called *grilheiros.* (Source: summarized from Diegues 2000a).

At the community level, beach fishers and urban-based fishers are competing groups. These two communities have different livelihoods, and some divergent interests but most of their agendas have common points, which is further explained in the Chapter 5 of this thesis. In relation to major issues such as the maintenance of their sources of income and subsistence, and fisheries management, these two communities have pretty much the same interests.

**Figure 10: Fisher's son helping to pull hoop-nets for shrimp**

Despite of that, these communities does not come together to fight for their needs but instead compete for getting a better position on the other. There is lack of leaders to mobilize the fishers from the two communities and unite them around their common interests to negotiate with IBAMA and other external organizations. The absence of unity has lead to the inability to create an association or other kind of formal organization exclusively for the Peixe Lagoon fishers, i.e. there is no association of Peixe Lagoon National Park fishers.

One of their divergent interests is related to the timing of opening the pink-shrimp season. Urban-based fishers usually prefer that the season officially starts only after they finish harvesting the onion crop (which happens in December), while the beach fishers argue that in December there are usually good size shrimps in the Lagoon and the season should be already opened. There are also divergences regarding the best time to open a connection between the Lagoon and the sea. Urban-based fishers, especially those whose family own land in the area of the National Park, prefer that the connection be opened sooner, because the water occupy the lands in which they raise cattle. Another

disagreement is about the number of nets allowed for each fisher, as each beach fisher has the right of using 30 hoop-nets while urban-based fishers are allowed to fish with 20 hoop-nets. The latter argue that they should be allowed to work with the same amount of nets, while the former argue that urban-based fishers should keep fishing with fewer nets because they have other sources of income beyond fishing.

Despite the fact that the culture of people from Tavares and Mostardas cities are closely related to the Azores and to the fisheries, the fishers are not involved in the organization of any of the events which celebrate that culture. Every two years an "Exposition of Shrimp and Onion" (locally called EXPOCACE) occurs in Tavares city. The event lasts for a week and is filled with activities promoted by the municipal government for attracting tourists and divulgating the city and its main economic products, i.e. onion and shrimp. The few fishers who have participated do so by making demonstrations about how to use their fishing equipments (Figure 11) and exposing fisheries products for selling. Parades for spiritual entities related to the ocean such as *Nossa Senhora dos Navegantes* and *Iemanjá* are organized annually by the Catholic Church and African religions groups (*Candomblé*). Fishers participate in those activities but they are not usually involved in its organization, and religion does not have any major impact on their cohesion as a group neither in the regulation of fishing activities.

The issue of lack of unity between the two communities and between the individuals within those communities should not be underestimated, as it hinders their ability to defend their interests. Further, it does not create the appropriate milieu for the establishment of a participatory approach for protected area management. If the individual fishers and fisher communities do not first create a cooperative spirit and more strong social ties among themselves, they would hardly be able to engage in collective action and management collaboration. Hardin (1968), when talking about the "Tragedy of the Commons", described a community with individuals without any connection with each other and driven by self-centered and utilitarian interests. However, communities with rich social connections and clear shared values are likely to engage in collective action and create mechanisms for regulating resource use (Jentoft 2000).

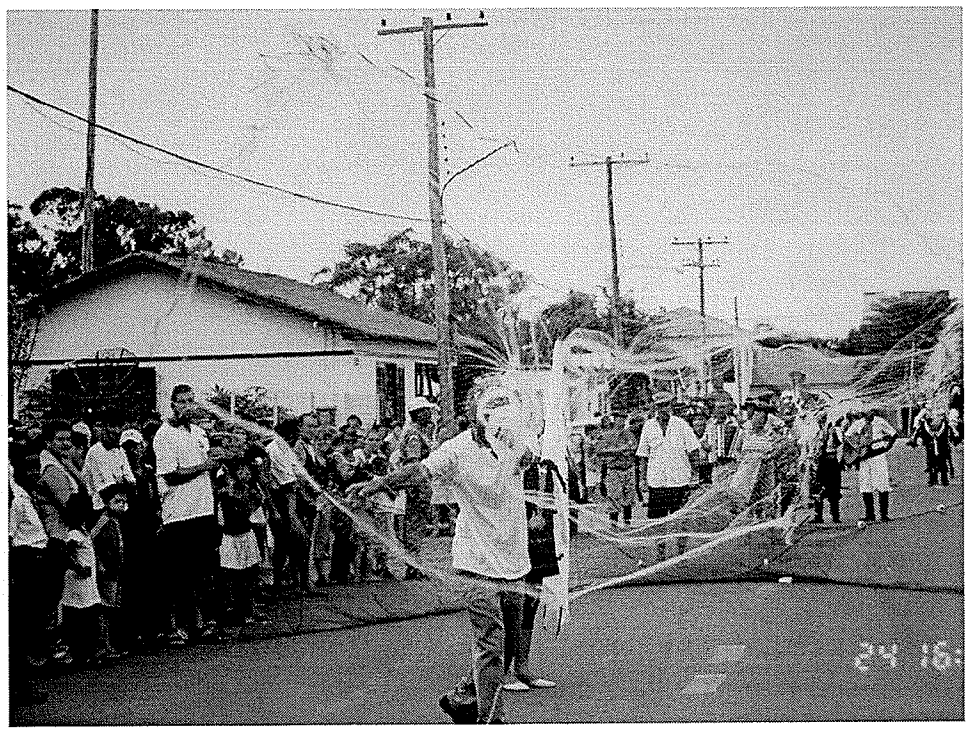

**Figure 11: Barra village elder demonstrating the use of cast-net**

### 4.1.1 **Individual and communitarian values**

Understanding of values and motivations which guide peoples' behaviours are essential for environmental management (Lane 2001). Conservation initiatives which take into consideration social-ecological systems should contain some analysis of values, interests and ethics of the stakeholders (Blankie and Jeanrenaud 1996).

Communities present a collective behaviour plus individuals with particular behaviours. The collective behaviour affects individual behaviours and vice-versa. Behaviour is an external factor, i.e. it is the visible result of internal processes such as the building of values, emotional state, and other inner phenomena which are not easy to be distinguished. Wilber (1995) defended the point that evolution occur in four dimensions at the same time: exterior-individual, exterior-collective (both related to behaviour), interior-collective (cultural) and interior-individual (spiritual, emotional). Looking at those dimensions may help us to better understand complex interactions related to social-environmental systems. While behaviour (especially that from communities) has been quite broadly studied, internal processes remains still a poorly explored field when

related to natural resource and environmental management (Tissot 2005). Culture and experiences (history) shape the way the community relate with external agents and how individuals interact inside the community.

Peixe Lagoon fishers describe themselves as having divergent interests among themselves and a competitive culture. According to them, competition and secrecy are intrinsic characteristics of fisheries. Fishers usually do not reveal to others the places where good catches are found, unless those have close friendship or kinship ties. Fishers have been telling that even when they do not have good catches they usually say to the other fishers that they did have good catches, as it makes them to keep being respected inside the community. In fact, those who are considered as the best fishers usually are more respected and may occupy a position of leadership in their village and community.

However, this competition mentality has contributed for making fishers not to trust each other. When asked about the possibility of creating a cooperative in their communities for improving market conditions, most fishers said that it would not work because they suspect that some fishers would cheat and take advantage of the others.

Peixe Lagoon fishers seem to have a low self-esteem and do not seem to believe in their own capacity to change the situation. When studying fishers of Rio Grande do Sul, Garcez and Sanchez-Botero (2005) had a similar finding and attributed it to low education levels. But in the present case, the low self-esteem may be related to multiple factors, including their historical lack of experience with participation, their inability to deal with more powerful groups such as big fishers and the government, and the precarious situation they find themselves in with their temporary licences.

Another inner characteristic that have considerable implications for hindering fishers' abilities to engage in participatory processes is their peculiar mindsets. Fishers have different mindsets than researchers, officials and other urban-based groups. Even urban-based fishers have different ways of thinking than other urban workers, and beach fishers are still more different. The beach fishers have spent most of their lives isolated from people from other regions and with little contact with the urban environment. That is because, this region is located in the middle of a 400 km sand strip which had no paved access roads at all until 15 years ago and today these roads are still unfinished.

These communities are not used to a formal environment or participating in pre-arranged meetings. When they have some concern, they use to talk with each other in the streets, bars or even in the middle of the Lagoon while fishing. Preparing them for participating in collaborative processes requires some kind of training, capacity building and provision of incentives. While this process is carried out, some other mechanisms for allowing them to provide their inputs for management should be designed. For example, fishers' representatives and other participants of multi-stakeholder bodies could be encouraged to contact the fishers during their daily common activities in order to exchange opinions, discuss their interests and share knowledge.

### 4.2 Leadership and Representation

The factors that have lead some fishers to be recognized as leaders within their communities are not quite clear. In general those fishers who are respected for their fishing skills take a leadership role in their villages and communities. Those who take the initiative to participate in dialogues with external organization are also seen as leaders. In other cases, those who have a better financial condition or a higher level of formal education are seen as leaders as well.

If we consider a leader as someone able to mobilize others and set a track for others to follow, we may argue that among the Peixe Lagoon fishers it may be difficult to find a real leader. In fact, a considerable number of fishers – including some of those sometimes recognized as leaders - do not recognize anyone with a leadership role inside their community. On the other hand, there are those definitely recognized as village or community 'representatives'. As there has been opportunity for fishers to participate in multi-stakeholder bodies, at least one fisher per village have been spontaneously chosen by their village fellows to represent them in those meetings.

Although misrepresentation of common interest is a common problem related to local level organization among other groups of small-scale fishers in southern Brazil (Reis and D'Incao 2000, Kalikoski and Satterfield 2004), Peixe Lagoon fishers does not recognize it as a problem that affects them. In fact, the work of these representatives has been seen as neutral by their fisher fellows, that is, it does not have any major positive of negative outcomes. As said by a Praia do Farol fisher: "*our representatives are just like*

*any of us, they don't have the skills to negotiate with people from IBAMA. They can't do much, but I understand it is not their fault*".

Fisher representatives have never had any training for taking part of participatory processes and also lack incentives for doing so. The work is voluntary, and the representatives have actually to miss working days and spend their own resources for attending the meetings. Those reasons also contribute for their fellows villages not to blame them for not provoking any significant change or not bringing any major benefit out. They feel that representatives have no obligation of doing a better job than they have done, as it has a voluntary character. In addition, the National Park administration has the last word in the meetings, and *a priori* there is anything the representatives can do against that.

For those reasons fisher representatives are mostly not seen as leaders. In only few situations some of the representatives were able to mobilize their village or community for some activity. There have not been leaders who strongly engage themselves and who are able to bring other fellows together for struggling for better conditions for their communities.

The only situation in which some mobilization took place as consequence of the role of representatives was in the organization of a protest. The protest happened in 2002 because of a decision taken by IBAMA related to keep the pink-shrimp fishing season closed despite of the Lagoon being drying out. As the fishers were seeing the pink-shrimps dying without having the permission to catch them, *Praia do Farol* village representatives contacted the president of the Fishing Forum and of the Fishing Labour Union Z11 and mobilized fishers for protesting.

Most of the work of organizing this protest was done by three fishers from who had been *Praia do Farol* village representatives. Their role was related to make contact with their political representatives and calling their fellow fishers for the manifestation. They also drove fishers to the place of the protest and provided food for them, which was paid with their own resources. The protest took place in an access road to the beach which crosses the National Park, and counted with the participation of at least 70 fishers. The protesters placed their nets in the water and blocked the access road in which the enforcers could come. It lasted for one whole day and resulted in the opening of the pink-

shrimp season in the following day. Although this action was successful it was only an isolated event. Other actions of this kind have not happened since then, indicating that it did not trigger a change within the community towards strengthening them to fight for their interests.

### 4.3 Community Institutions

#### 4.3.1 Formal institutions for commercialization

The establishment of formal institutions by the Peixe Lagoon fisher communities has been exclusively related to the creation of fish storing and processing houses (FSPH). Today one of those houses is working in Praia Nova village, one is ready for start working in Tavares city and other two has been planned in Capão Comprido and Praia do Farol villages. EMATER has been providing essential support for all these projects.

Praia Nova village has a fish storing house which started to work on 2005. It has a pretty simple structure, with twelve freezers and an icemaker machine. The associated fishers pay a monthly fee and are able to keep their catches in the freezers for getting better opportunities for commercializing it (e.g. in the summer time when they can sell it to tourists). The president of the association is a new fisher in the community which arrived with a broader vision. The building of the fish storing house counted with resources from a RS state funding program (called RS-Pesca). As a requirement for getting funding, and for the purpose of administration of the storing house, the fishers created an association called Fishers Association of the Balneário Mostardense. The association has around one hundred associated fishers and only twelve of them are Peixe Lagoon fishers. Therefore, this association can be viewed partly as community self-organization and partly as a horizontal linkage.

Tavares city FSPH was created in 2004 and is the fish storing house with the largest structure in the region. It has a cold-chamber, freezers, an ice-maker machine, fish and shrimp cleaning machines. It was also created with the support of EMATER and funding from the RS-Pesca program. Although the considerable funding received, which was around R$ 120,000 (equivalent to CAD$ 72,000), the Tavares FSPH project couldn't be finished, and the building and some machines have been kept with no use since 2004 (Figure 12).

As a requirement for funding applications, an association (Association of Artisanal Fishers from Tavares, or APAT) was created, with the assistance of EMATER. Today the association exists in the paper but has no role in the community. It has fifty associated fishers, and all of them are Peixe Lagoon fishers. In practice, EMATER staff has been the responsible for the creation of the project and of the association, and for most of the decisions related to it. The fishers have complained about some of those decisions, especially related to the location of the building, which is considered inappropriate, and the way the resources got through the funding programs has been spent.

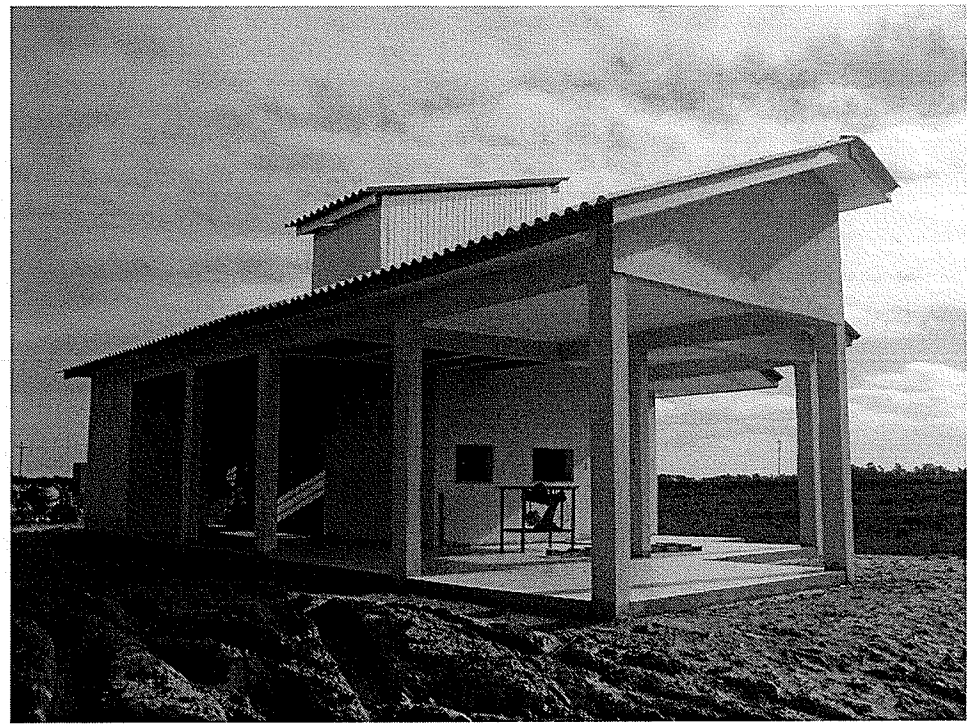

**Figure 12: Tavares fish processing plant still under construction**

In September 2007 EMATER was able to rise more funding from a federal program for rural development (known as PRONAF), and is currently working for setting the FSPH in conditions for functioning and trying to pass the attribution of stewardship on to APAT. EMATER staff is having a difficult time in accomplishing the latter task as the fishers do not believe they are going to be able to steward an enterprise like that. In

addition, they have argued that without external support, some fishers would cheat on others.

Differing from the Tavares FSPH - which has several equipments and a relatively high capacity of storage - the fishers from *Capão Comprido* and *Praia do Farol* village are willing to build simpler structures only for stocking their captures. At this point, fishes still depend on EMATER for doing the project of construction and for getting governmental funding.

### 4.3.2 **Informal institutions for resource management**

Contrary to the formal institutions created mainly due to external interventions, informal institutions for resource and lagoon management have been devised by the Peixe Lagoon fishers. Fishing spots control (both in the Lagoon channel and in the beach) and the annual opening of the Lagoon mouth were strategies established because of the necessity of conserving resources, protecting fishing spots and keeping the Lagoon water conditions in a way that does not menace the households safety.

The institutions above mentioned are well established and work in a continual basis, although they are still not legally recognized and have been threatened by the National Park administration. Other informal management strategies have been carried out in a non-continual basis, i.e. they can be seen as intermittent institutions. One of those is the adaptive closures of pink-shrimp fisheries. Following there is a presentation of both well-established and intermittent institutions.

#### 4.3.2.1 Lagoon mouth management

Peixe Lagoon has a cyclical regime of water and organisms exchange with the adjacent ocean. The connection between these water bodies naturally closes in the summer and could remain closed for decades - according to the fishers - if they did not manage it. Therefore, local fishers and farmers every year (usually in August) open a ditch which connects the Lagoon to the sea.

This management strategy has been done at least since the beginning of the nineteenth century. When the French naturalist Saint Hilaire visited the Peixe Lagoon region in 1820, he documented that there were houses along the Lagoon and its dwellers

used to open a connection between the Lagoon and the ocean with spades in order to allow a great amount of fishes to enter the Lagoon and be easily caught (Saint Hilaire 1887). The practice of manually digging the ditch was kept until the decade of 1970. For organizing the process, a fisher or farmer used to ride a horse and visit as many families as he could to inform the day of opening the Lagoon mouth. In that day, some fishers crossed people from the city-side to the beach-side of the Lagoon for them to help digging the ditch. In the 1970 decade, municipal governments from Tavares and Mostardas started to send every year two backhoes for doing the work (Figure 13).

**Figure 13: Backhoe opening the Lagoon mouth**

What has not changed is the necessity of an expert from the community, who usually is an elder from *Barra* village. This person tells when, where and how the ditch must be dug. Only a few fishers recognize to have this knowledge, and usually during a whole generation no more than two fishers are responsible for establishing the conditions for opening Lagoon mouth. According to elders' knowledge, there are at least four major

variables which influence such decision: wind direction and intensity, level of the Lagoon water, level of the sea water and position of the Lagoon channel.

For opening the ditch it is necessary that the Lagoon be overflowing, what usually happens in August, as there is abundant precipitation during the winter. As the rain water keeps trapped into the Lagoon, the farm fields around it get flooded and the water level reaches the entrance of the Barra village households. At this point, farmers and fishers ask municipal politicians to send backhoes in the next day in which the northwest wind blows. This wind direction is necessary because it pushes the Lagoon water towards the ocean, building the natural configuration of the Lagoon mouth after the ditch is opened. The sea level must be low at that day otherwise the water trapped in the Lagoon does not flow properly for building the Lagoon mouth.

The more tricky part of the process is deciding where exactly the ditch must be dug. The fisher responsible must know where is the Lagoon channel for indicating the place where the ditch must be placed and its direction, as the Lagoon mouth must be connected with the Lagoon channel allowing the water to flow properly. There is also a correct width and depth to be dug as the water stored should not leave the Lagoon too fast, but should flow continuously during some days, not allowing the sea to bring sediments back inside the ditch, which would close it.

According to the fishers, opening a connection between the Lagoon and the ocean allows for a rich exchange of nutrients and species between these environments. It allows several species of fishes, molluscs and crustaceans to enter the lagoon for reproduction and feeding. Some of them go back to the ocean while others serve as food mostly for the fishers and birds. This is an example of human activity which has a positive impact, increasing the resilience of the lagoon social-ecological system. It is a case in which we can say that there exists a 'human ecosystem' according to the term used by Lane (2001) where a traditional human activity has became part of the local ecological processes. This activity is essential for maintaining the food web in the Lagoon and consequently the flux of animals which comes and goes to this region, including those that are the main reason for the creation of the National Park, the migratory birds.

Conflicts over this issue have been rare, as the National Park administration has not been opposed to such activity so far. However, Instituto Chico Mendes have been

planning an investigation in partnership with academic researchers about the consequences of not opening the Lagoon mouth for some years. They have not yet come up with a plan for compensating fishers who will be strongly affected for that measure as fisheries in the Lagoon will become unfeasible during the period of the project.

4.3.2.2 Control of fishing spots

The control of fishing spots is an institution created by beach fishers. Such control takes place both in the ocean fisheries, exercised by fishers who live in all the beach villages, and in the Lagoon fisheries, exercised only by fishers from Barra village. Before the beginning of the 1980's decade, when an increasing number of people started to take fishing as their main source of income, there was no control of fishing spots.

Fishers from the Barra village started to protect the fishing spots close to their houses, which are located in both sides of the Lagoon mouth. This is a strategic area for fishing as the species entering and leaving the Lagoon have to pass through this narrow area. The creation of such institution was triggered by the increasing number of outsiders coming to fish in the Peixe Lagoon. The owned fishing spots became known and respected by fishers from Barra and other fishing villages, and the owners of spots struggled to protect effectively their fishing spots from outsiders.

After the creation of the National Park, the responsible federal environmental agency at that time restricted access to outside fishers, what automatically strengthened the control over fishing spots. With the fisheries in Peixe Lagoon restricted to local fishers, those from Barra village were able to protect successfully the fishing spots close to their homes. This situation lasted until around five (5) years ago when the National Park administration decided to forbid fishing in the Lagoon mouth area. Today, fishing in this area is allowed only when the Lagoon mouth is closed, and the fishing spots control is carried out during those periods but in a less intensive way than used to be before, as higher catches happen when the Lagoon mouth is opened.

This resource management institution developed only in Barra village due to the lower costs of protecting fishing spots in that area, and because fishing near the Lagoon mouth produces high catches. Therefore, protecting the fishing spots in this area has lower costs and higher benefits than protecting other areas. In fact, territoriality only

makes sense in situations in which the benefits pay off the costs of protection (Begossi 2001, Castro and Begossi 1995). The fact that nets in use constitutes a fixed technology helped for the establishment of territoriality as they are easier to monitor than mobile fishing nets (Begossi 1998, Almudi *et al.* 2008).

Fishers from the beach, including those from Barra village, started taking care of the fishing spots in the sea close to their houses also in the early 1980's. The fishing spots are identified by a wood stick and are placed 300 to 500 meters away from each other. Each wood sticks on land is connected to an anchor placed inside the sea through a rope which is used to tie the fishing nets.

As it happens in the Lagoon, there are no sanctions established for those who disrespect this institution. Despite of that, fishers tell that disrespect has been very rare. When the spot owner finds someone fishing in his spot, usually the 'invader' just takes his net out to avoid a more serious conflict with the owner and to avoid social constraints inside the community. Such institution limits the use of the fishing resources as only a certain number of fishers are allowed to use a fixed amount of fishing spots. In this case, the monitoring of fishers by themselves eases the work of the environmental agency officially responsible for controlling resource use.

Today, all the possible fishing spots inside the National Park are occupied as well as most of those nearby it. A fisher can become a fishing spot owner either by buying it or through heritage. The same pattern has been observed in territorial behaviour of other communities of small-scale fishers in Brazil (Castro and Begossi 1995). The price of a fishing spot varies between R$ 1,500 and R$ 3,000 (equivalent to CAD$ 900 and CAD$ 1,800). Usually there are no spots available for buying unless a fisher is leaving the region or needs the money for an emergency. The National Park administration is working to stop these negotiations as they are perceived as inappropriate to happen inside a National Park.

4.3.2.3 Closures to the pink-shrimp season

Establishing closures to the pink-shrimp fisheries has not been a continuous institution in the sense that there is not a mechanism for it to happen every year or every

time it would be necessary. Nevertheless, this resource management strategy has been carried out when the fishers are able to self-organize to make it work.

After the year 2000 the attempts for organizing temporary closures to the pink-shrimp season has been more often, probably due to decreasing in the stocks, which makes the adoption of measures to improve captures more necessary. According to fishers, attempts of closing the fisheries occur when the shrimps captured are under the commercial size. Despite the fact that every year during same period it would be necessary, most of the years fishers are not able to put it into practice due to lack of consensus and enthusiasm for enforcing it. According to information provided in interviews in three opportunities they were able to reach almost a consensus and effectively close the fishing season: in 2001, 2002 and 2004. That happened without support from the National Park administration.

The process starts with informal conversations in the camping areas where the fishers live during the pink-shrimp season. When enough people seems to agree that it is not worth continue fishing, they communicate fishers who are fishing in the other sectors of the Lagoon that the fisheries in that specific sector will be stopped for two weeks. This is the necessary time for the shrimps to grow considerably, reaching the commercial size, according to the fishers' traditional knowledge.

All the process is done exclusively by the fishers, but the opinion and advice of a PhD student which worked for the National Park on a participatory pink-shrimp research used to be a factor influencing decisions taken by fishers. Although the support of the National Park staff was asked for making sure that the agreed rule will not be broken by anyone, the enforcement ended up being done informally by the fishers themselves.

As the National Park administration does not interfere in these agreements, the fishers organize turns for monitoring among themselves to not allow hoop-nets to be placed in the water during the two weeks period of closure. Only once, some nets were found in the water during the closure, which resulted in an anonymous ripping of the nets meshes. It has been reported that when a needed fisher asks permission for fishing only enough for subsistence during the closure, the other fishers have allowed it if they know that the fisher who is asking really rely on that for feeding his family.

4.3.2.4 Attempts to ban butane lamps

Another intermittent resource management strategy is the agreement of fishing pink-shrimps without using butane lamps. Few years ago, Capão Comprido fishers agreed to fish without using lamps in a certain region of the Lagoon, as a strategy to catch a higher percentage of commercial size shrimps. According to the fishers' knowledge, adult shrimps actually move more than juvenile shrimps. The latter keeps buried in the bottom sand most of the time, and would stay there growing if they were not attracted to the nets by the lights.

This strategy has been encouraged by the National Park administrators. Although it seems to work pretty well, usually some fishers do not agree to adopt this measure and they end up having higher captures than the others. In addition, some fishers have argued that having luminosity is necessary for keeping visibility and decreasing the possibilities of robberies of nets and shrimps. Even considering this problem, this strategy could be further discussed and maybe agreed to be implemented for the whole Lagoon. If it was adopted for all the fishers, they would probably share the burden of having lower captures in the beginning of the season. Nevertheless they would also share the reward of catching better quality (i.e. bigger) shrimps and higher captures in the middle and end of the fishing seasons.

### 4.4 Implications for sustainability

The traditional fisher communities of Peixe Lagoon have devised institutions which have helped to maintain sustainable fisheries. They have even developed a management strategy for the Lagoon mouth which has become essential for the local ecosystems health as it allows for the maintenance of the food web in the Lagoon as it has been for centuries.

However, the fishers themselves have recognized that their resource management strategies would not be enough for maintaining a sustainable use of the resources if there were no governmental intervention. In the decades of 1970 and 1980 the number of outside fishers was increasing each time more. Despite local agreements were devised, such as territorial control in the beach and in the Lagoon, it was not enough to prevent outsiders to exploit as much as they could. These arrangements at best avoided outsiders

to occupy the fishing spots most important for the local fishers, i.e. those located just beside their dwellings.

After the creation of the National Park, the federal environmental agency has stopped most of the outsiders to keep annually harvesting the Peixe Lagoon, especially during the pink-shrimp season. Peixe Lagoon fishers recognized that this intervention was and has been essential for conserving ecosystems and its resources as they are today. As a Barra village fisher explained "*fishers from Santa Catarina State used to come here every year in big trucks... if IBAMA had not arrived here we would hardly see a fish fin today in this Lagoon*".

Therefore, Peixe Lagoon is a case in which participatory management is necessary for bringing together the contributions from different stakeholders that should include at least the traditional resource users and the government. The former have traditional knowledge for resource management but are not able to protect the local ecosystems alone. The latter hold power, resources and scientific knowledge but are not able to protect the local environment without the contributions and support of the local population. This has been proven by the existence of several illegal activities inside the protected area which the official enforcers are not able to stop. Those are mostly related to illegal fisheries and faming-related activities. Combining different sources of knowledge and adding efforts for management would increase the chances of achieving the common interest of resource and environmental conservation.

# Chapter 5: Aspirations, concerns and priorities

> *"The call to conserve the biodiversity in the populous developing world is unlikely to be achieved unless the aspirations of local peoples...are considered as a fundamental component of the conservation equation"*
> Lane 2001: 666

## 5.1 Beach Fishers Community

Table 10 summarizes beach fishers' aspirations, concerns and top priorities. This table is based on questionnaires applied to 25 fishers living in beach villages, which correspond to around 27% of the fishers from this community. This data were validated by checking the information against qualitative interview data.

For the beach fishers, maintaining their access rights to fishing resources is the most important priority. It determines their capacity of making a living and feeding their families. These fishers have a high concern about the access rights of their children as well, as most of them either have chosen or need to continue the profession of their parents for livelihood (Figure 14). Living inside the protected area or at least in its close surroundings is another priority of this community. The easy access to the fishing spots and the daily observations of environmental conditions and of the resources itself are advantages of living inside the protected area.

It also allows for their ecological knowledge to be maintained, updated and enriched, and for the monitoring and protection of fishing spots. However, for living inside the protected area fishers are concerned with the lack of improvements such as the maintenance of access roads and the availability of reliable drinking water and electricity.

Another issue of high importance for the community is to have the chance of continuing to participate in fisheries management, i.e. to have input into fishing regulations. On the other hand, they do not give high priority to participating in protected area management. During the interviews, when asking about protected area management, I tried to understand how important they considered in participating in decision related to subjects other than fisheries within the protected area.

**Table 10: Beach fishers' priorities ($n$ = 25)**

| | Top Priority | Very Important | Important | Little Important | No answer |
|---|---|---|---|---|---|
| Fishing inside the Park | 100* | 0 | 0 | 0 | 0 |
| Living inside the Park | 72 | 24 | 4 | 0 | 0 |
| Better conditions for the Park (electricity, roads) | 72 | 24 | 4 | 0 | 0 |
| Participating in fishing management | 56 | 44 | 0 | 0 | 0 |
| Fisher's children allowed to fish | 56 | 24 | 12 | 8 | 0 |
| Participating in protected area management | 16 | 32 | 24 | 28 | 0 |
| Ability to increase fishing effort | 20 | 16 | 32 | 32 | 0 |
| Having alternative sources of income | 0 | 16 | 24 | 60 | 0 |

* Numbers presented in percentage

**Figure 14: Fisher's child (background) helping to fix trammel nets**

According to most fishers, issues not related to fisheries (such as restrictions of activities in the dune zone and cutting *Pinus* forests – Figure 15) are not part of their responsibility or interest. Nevertheless, some fishers would be willing, and give priority, to assist the National Park administration in the management of broader issues related to protected area management. These fishers recognize that even decisions not directly related to fisheries may have significant effects. Experienced fishers, for example, have argued that the removal of the *Pinus* forest from the margin of the Lagoon would accelerate sedimentation.

**Figure 15: Planted *Pinus* monoculture in the margin of the Peixe Lagoon**

Ability to increase fishing effort through the use of more nets or fishing for a longer period has not been considered a priority. Most of the interviewees declared to be content with the number and length of nets allowed and with the places and periods in which fishing is permitted. Having alternative sources of income is not one of the main concerns of this community either. When asked about this theme, most of them answered that they just want to continue fishing as that is what they really know how to do. In addition they declared to be pessimistic about other sources of income.

In spite of the fact that there is no quantitative data related to fishers' interest in receiving compensation to stop fishing and to leave the National Park area, this issue was frequently raised during the formal interviews and informal conversations during qualitative data gathering. The majority of beach fishers would only agree to leave their homes and quit their profession if they could get a pension on a continued basis which would allow them to rely on it as main source of income for the rest of their lives.

Most of the interviewees argue that fishing is the only professional ability they have got, and even if the government gave them a certain fixed amount of money it would probably end at some point, leaving them helpless. Having said that, most of them do not expect the government to provide compensations good enough for sustaining them and their families. Even if they were to get such compensations, some fishers still would not be willing to leave their territory: "*taking us out of our land is like killing us... there are people here that have lived their whole lives inside of what today is the Park. It has a high emotional value that any monetary compensation can not pay*"

### 5.2 Urban-based Fishers Community

Table 11 shows which issues have been considered by urban-based fishers as their priorities and main aspirations. Around 15% of the fishers from this community were quantitatively interviewed, and this data were also validated by checking the information against qualitative interviews.

It is possible to observe that the priorities and concerns of the urban-based fishers are similar to those of the beach fishers. Nevertheless, as one would expect, the issues of living inside the protected area and the maintenance of access roads and electricity are not as relevant for this community as it is for the other. Besides, the data indicate that the concerns with the resource access rights for the fishers' children is lower for the urban-based fishers, which can be explained by the fact that many of their children have never engaged in fishing activities. As they have lived in urban areas, it facilitates their efforts for studying or looking for employment instead of struggling for continuing their parents' profession.

**Table 11: Urban-based fishers' priorities ($n$ = 11)**

| | Top Priority | Very Important | Important | Not Important | No answer |
|---|---|---|---|---|---|
| Fishing inside the Park | 100* | 0 | 0 | 0 | 0 |
| Participating in fishing management | 64 | 18 | 18 | 0 | 0 |
| Living inside the Park | 55 | 18 | 27 | 0 | 0 |
| Better conditions for the Park (electricity, roads) | 37 | 27 | 9 | 0 | 27 |
| Fisher's children allowed to fish | 27 | 46 | 0 | 27 | 0 |
| Participating in protected area management | 28 | 9 | 18 | 27 | 18 |
| Ability to increase fishing effort | 0 | 55 | 36 | 9 | 0 |
| Having alternative sources of income | 0 | 18 | 55 | 27 | 0 |

* Numbers presented in percentage

Fishing inside the protected area is the single most important priority of urban-based fishers. Similarly to beach fishers, fishing is their main source of income and to be deprived of that would have major negative consequences for their livelihoods. Participating in fishing management is also of high importance as fishing rules can considerably affect fisher's livelihoods. For them, negotiating with the National Park administration in the multi-stakeholder bodies has been an opportunity highly appreciated and should be maintained.

Even considering that living inside or very close to the protected area and improving conditions of living inside the National Park are not as important for urban-based fishers as it is for beach fishers, they are still relevant issues and have been considered as top priority by a considerable number of interviewees. Many urban-based fishers explain that they only do not live inside the National Park because of the difficult conditions of living there, especially due to lack of electricity, running water and reliable access roads. Once those conditions are improved, a considerable number of urban-based fishers affirmed they would move to inside the protected area.

Urban-based fishers have different opinions among themselves about the importance of participating in the management of the protected area. While some consider it a top priority, others think it is not important at all, and still others do not have a formed opinion about it. In an initial stage of protected area co-management those who recognize the importance of participating in taking decisions about issues rather than fisheries could be the first to be engaged. Others would probably join at the point they realize their participation would be meaningful and bring benefits to them.

Similarly to the results found for the beach fisher community, urban-based fishers demonstrated to have the wish to increase fishing effort at a certain extent, but it is not one of their main concerns. Having alternative sources of income is also not considered one of the greatest aspirations of the community once they believe fishing inside the protected area can provided a source of income which they would hardly find in other jobs, especially because of their low level of formal education.

The urban-based fishers were not quantitatively asked about acceptance of compensation either, but I was able to have informal conversations with many of them about this matter. These fishers are more likely to accept compensations for stopping fishing than the beach fishers. Some factors facilitate this to happen. The first of them is the fact that the urban-based fishers do not live in the National Park area and therefore would not be obligated to leave their houses. In addition, they are more used to the life in the city than the beach fishers are, and most of them already have some source of income beyond fisheries.

### 5.3 Additional Hopes and Concerns

In addition to the concerns and aspirations above mentioned, other issues were often mentioned by fishers from both communities during interviews and informal conversations. The most prominent of those issues are (1) prohibition of most of the middle-men to access the protected area, (2) lack of time for adaptation for new fishing rules, (3) decreasing in the captures of fishes and shrimps, (4) restriction of access to resources to disadvantaged (less-empowered) local people, and (5) the all-year-long presence of industrial vessels illegally fishing inside and outside the National Park.

The issue of the middlemen was mentioned by practically all the interviewees, demonstrating its high relevance. The fishers have argued that in the last four years, since

the middlemen have lost the right to access the National Park, they have to sell their captures below the prices they used to sell before. As today only four middlemen effectively buy most of the captures of the Peixe Lagoon fishers, they have not been able to buy a considerable part of what the fishers capture. Therefore, fishers are compelled to transport their captures for outside the National Park for looking for opportunities of commercialization, which are not always easy to find.

In regards to fishing rules, almost every year the National Park administration update them and the modification are done just before the main fishing season, i.e. the pink-shrimp season. Changes in the way fishers are allowed to work may cause major impacts on their economy. In a worst case scenario fishers would not have time to adapt to the new rules at all and would not be able to fish, losing their major source of income. In the current year for example, fishers fear that they will be unable to fish if the National Park administration pass a rule changing mesh size allowed for hoop-nets used for fishing pink-shrimps.

Both communities demonstrated to be quite concerned with the decreasing in catches of the main fishing species. This issue has been attributed mainly to the industrial fishing vessels which fish legal and illegally in the Rio Grande do Sul State coast. It has been each time more difficult for fishers to make a living due to shrinking of fishing stocks and difficulties for commercialization of their captures. For that reason, Peixe Lagoon fishers strongly agree that the access to fisheries in Peixe Lagoon should not be totally opened otherwise the captures would not be enough for all, and it would reduce the stocks still more.

Control of access to resources is one of the main reasons why the fishers valorize the presence of IBAMA in the Peixe Lagoon. Most of the fishers believe that the environmental protection role of this agency is necessary but that officers' work should be done differently, with more dialogue with the local population, offering alternatives and more information instead of only limitations. The way local fishers consider the protected area is a paradox. Depending on how the question is asked fishers may answer favourably or against the existence of the protected area. In one hand they valorize it and recognize its importance, saying that the protected area should be implemented. On the other hand they are against it in the sense that the environmental agency responsible for

its implementations create barriers for their livelihoods and ultimately have the objective of excluding them from that territory.

Still in regards to rights of access to resources, fishers demonstrated to have concerns with local people who need to fish for subsistence or income but have not been allowed to do so. Some fishers defend that there is a limited number of needed local people who should also have some rights of access to resources. Those fishers even argue that, if necessary, the total amount of nets allowed to be used in the Peixe Lagoon should be re-distributed to benefit needed people.

Another often mentioned issue is related to the presence of dozens of industrial fishing vessels using dragnets in the ocean just behind the surfing zone (Figure 16) when they where supposed to be at least three (3) miles far from the coast according to the legislation. This illegal fishery has taken place for decades inside the protected area, in its immediate surroundings and in a considerable part of the Rio Grande do Sul coast. Peixe Lagoon fishers complain that many restrictions are imposed upon them while industrial vessels causing a far higher level of environmental impact continue fishing illegally without any visible opposition.

**Figure 16: Industrial vessels fishing illegally inside the 3 mile limit**

# Chapter 6: Institutional Interplay

The purpose of this chapter is to present - and to provide and analysis of - the institutional connections Peixe Lagoon fisher communities have in the horizontal and vertical levels. Institutional interactions not related to the local communities which have some influence on the management of the protected area also makes part of the scope of this chapter. At the end, the chapter presents possibilities of improving existing connections and opportunities for the local communities to establish new interactions and partnerships both with local and non-local organizations.

## 6.1. Multi-stakeholder Bodies

### 6.1.1 Peixe Lagoon Fishing Forum

The Peixe Lagoon Fishing Forum was created in 1998 by IBAMA and local politicians. The main purpose of this Forum is to provide opportunity for the National Park administrators and local fishermen to discuss about problems related to fisheries. This Forum has no power to modify policies or rules applied to the National Park but it serve as a venue for fishers to express their concerns.

The Fishing Forum administration must be elected by the fishers. For the most part of its existence, a Councillor from Tavares has been the president and a Councillor from Mostardas has been the secretary of the Forum. The fact that fishers do not occupy these positions indicates their lack of leaders, especially when it comes to formal arrangements. Nevertheless, the councillors have been recognized as good representatives by the fishers. The Fishing Forum president was the one most cited in fishers' answers for the question "which person or organization has better represented your interests?" Actually not many others were cited. In addition to the Fishing Forum president, the Fishing Labour Union president was cited few times.

Beyond IBAMA staff and local politicians, one representative of owners of lands inside the National Park, one EMATER official and the president of the Fishing Labour Union participate of the meetings (Figure 17). In addition, each village in the beach or locality in the cities must choose one fisher as representative. There are ten fisher representatives in total participating in the Forum, i.e. six representatives of beach fishers and four representatives of urban-based fishers. Nevertheless, the meetings are usually

held in Tavares city and the attendance of the urban-based fishers is equal or higher than the beach fishers. There is no financial incentive for participation, but Tavares municipal government usually makes a bus available for bringing beach fishers for the meetings when the conditions of the roads allow it.

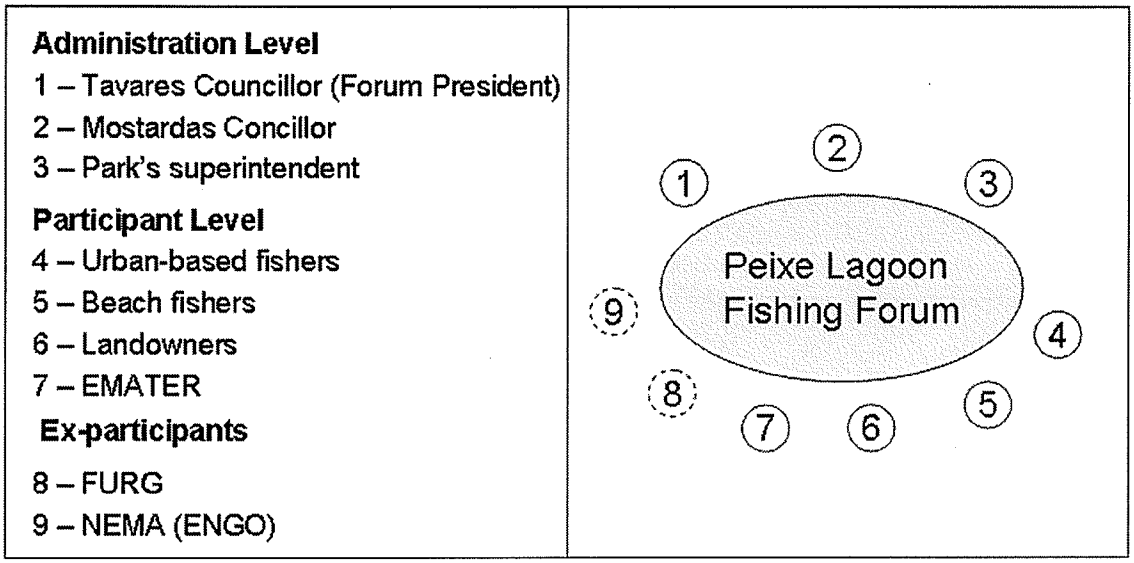


**Figure 17: Participants of the Peixe Lagoon Fishing Forum**

During the first years of existence of the Forum, a representative from the Federal University of Rio Grande (FURG) and a representative from NEMA – which is an Environmental NGO from Rio Grande city[4] - used to participate as well. Due to difficult of access and lack of interest, they do not make part of the Forum anymore.

Despite of the fact there is no official mediator in the Forum meetings the representative from EMATER has informally taken this role, facilitating the dialogue between fishermen community and National Park staff. This role has been positively recognized by the fishers who take part in the Forum.

According to the fishers, the main factors that have hindered participation in the Forum meetings are the lack of perception about the immediate benefits of those meetings (or true lack of the benefits) and the fact that fishers are not used to this kind of activity. Other factors include, when it is the case, difficult access to the meeting place,

[4] The city in the south which most influences that region.

necessity of skipping most part of their work day and lack of agreement among fishers and between fishers and other interested parties.

In addition, some power relations can be observed in the meetings, constraining participation at a certain level. The Park National officials have the power of creating, changing and enforcing rules which directly affects the fisher communities. For this reason, fishers' representatives are usually uncomfortable in arguing with their opponents, fearing to suffer some kind of persecution afterwards. A more subtle misbalance of power occurs between the fishers with a high level of influence in their communities (such as those who work as middlemen) and other fishers. Information provided by institutional agents who participate in the Forum indicates that most fishers fear to disagree with other fishers who are more influential in their communities.

According to Forum participants, around three or four Forum meetings usually take place every year. It basically only occurs for dealing with immediate issues such as: (1) the date of opening the pink-shrimp season, (2) extension of the legal fishing season, (3) necessity of opening the Lagoon mouth, and (4) opportunities for funding. Meetings for discussing more important and deeper problems practically do not exist. Examples of these problems are the necessity of switching the protected area status for allowing the fishers to continue living in the protected area and the permission of fishers' children to maintain their livelihoods and culture by fishing in this area.

### 6.1.2 **Peixe Lagoon National Park Advisory Council**

The National Park Advisory Council was officially created in 2006 by IBAMA as a requirement of SNUC. The National Park administration is automatically the responsible for leading the Advisory Council. This council is intended to further dialogue between IBAMA and the diverse interested parties within the local population (Figure 18), furthering public participation in decision-making related to the protected area.

With a broader scope than the Peixe Lagoon Fishing Forum, other issues beyond fisheries must be addressed by the Advisory Council, such as tourism, agriculture and industrial development. Advisory Councils, according to SNUC, do not have the power to take decisions, but just to serve as a dialogue platform for guiding the decisions taken by the environmental agency responsible for managing the protected area.

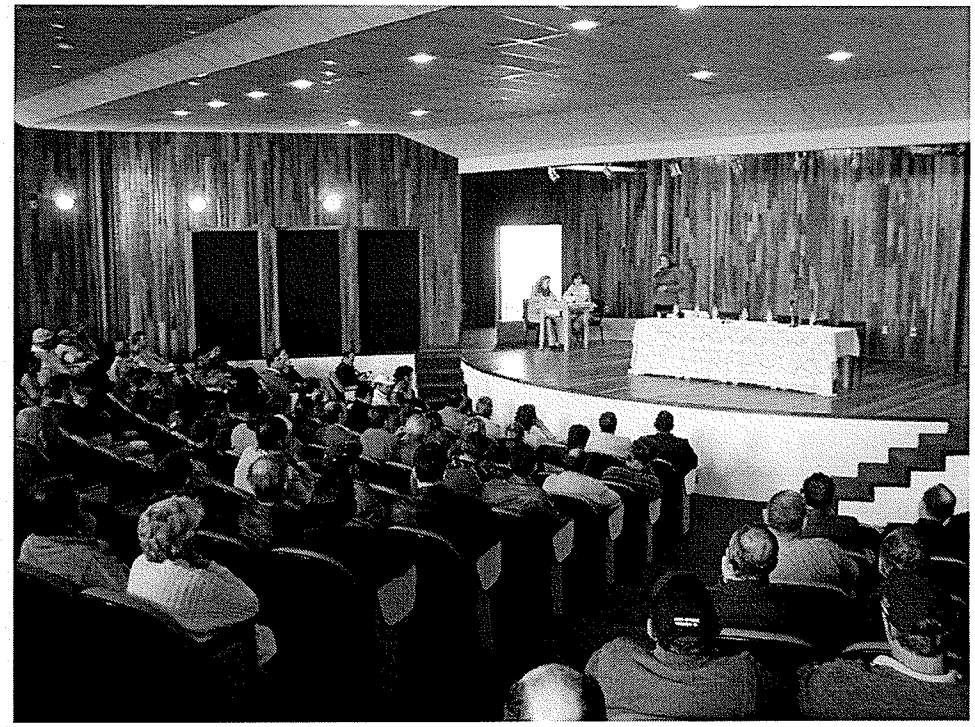

**Figure 18: Plenary of an Advisory Council meeting**

Table 12 shows which organizations and groups are represented in the Advisory Council in addition to IBAMA. Discussion taking place at the Advisory Council meetings are clearly polarized in two groups. The first group is formed by preservationists lead by the National Park administration and the second one is formed by all the other participants.

As I could observe by participating in a meeting, the discussions occurring at the Advisory Council can be characterized as a 'battle of nerves'. The second group complains about their historical and current losses in virtue of the National Park and the first group try to defend their points in favour of preservation and observing the law. The conflict reflects the different values held by the two groups.

Figure 19 presents roughly the polarizations observed in the discussions taking place in the Advisory Council meetings. Organizations and groups in favour of development or maintenance of *status quo* struggle to convince the National Park

administration not to jeopardize their livelihoods, while the preservationists organizations stand on the side of the environmental agency.

**Table 12: Participants of the National Park Advisory Council**

| |
|---|
| **Government**: Tavares and Mostardas municipality governments, Tavares and Mostardas Councillors, State Ministry of Tourism, State Ministry of Environment, State Ministry of Fisheries |
| **Fisher representatives**: Fishers Assoc. of Balneário Mostardense, Tavares Small-scale Fishers, Labour Union Z11, Fisher's wives, National Park Fishers, APAT, Fishing Forum |
| **Farmer representatives**: Mostardas Rice Planters Association, Tavares and Mostardas Rural Labour Unions, Tavares and Mostardas Rural Workers Associations, Land Owners of the National Park |
| **Universities**: FURG, URGS, ULBRA, UNISINOS |
| **ENGOs**: NEMA, Lagoa Environmental Conservation, Curicaca, Marica |
| **Industries**: Forestry industries, State Forestry Industries Association |
| **Others**: EMATER, Atlantic Rain Forest Committee, Coastal Hydrographic Basin Committee, Hotel owners, Craftsmen Association |

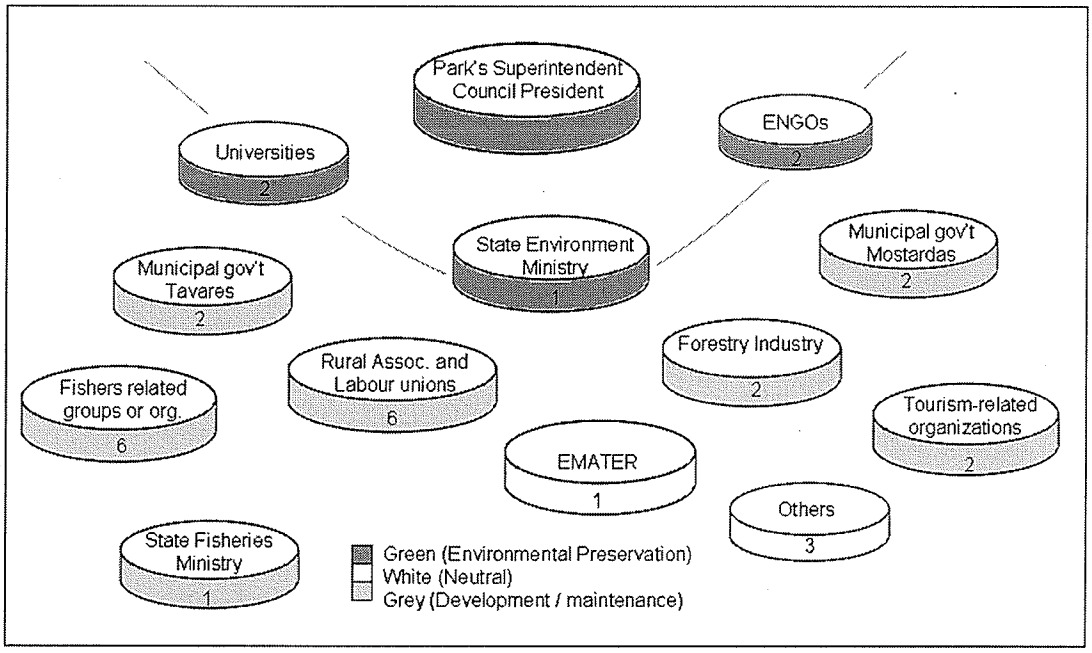


**Figure 19: Polarizations within the National Park Advisory Council**

There are five spots available for fishers' representatives plus three spots for fisheries related organizations in this Council. The fishers who participate in the Advisory Council are pretty much the same people who are involved with the Fishing

Forum. Innovatively, the fishers' wives have a spot in the Advisory Council. Despite the relatively high number of representatives, the fishers do not have the same communication skills as the other party representatives. In the Council meetings, the focus of the local politicians usually deviates from fishing issues to issues of concern of the more powerful groups. As explained by a fisher representative "*There is nobody to help us make our points; there is not much we can do by ourselves ... we go to the meetings but it is like when a bad team plays against a good team... you already know who will win before the match starts*".

Since some groups are more empowered, mechanisms should be developed to ensure that different groups be objectively engaged. Assistance and capacity building should be provided for the less empowered groups to be able to discuss with the local elites at the same level.

### 6.2 Interactions Outside Multi-stakeholder Bodies

#### 6.2.1 **Horizontal linkages**

Horizontal linkages are related to the interplay between the two Peixe Lagoon fisher communities and the interactions of these communities with other citizen groups below the municipal level (Figure 20). As the interactions between the Peixe Lagoon communities were explained in the Chapter 3, in this section I focus on the interactions of those communities with neighbouring fisher communities. It is worth to mention that Peixe Lagoon fishers also interact with the farmers who own land in the National Park area. Those farmers are represented officially by an association organized at the municipal level, and for this reason I have considered it as a vertical linkage.

There are not many interactions between Peixe Lagoon fishers and other groups of fishers. The most part of it occur with **illegal fishers** from Tavares and Mostardas municipalities and with **exclusive beach fishers**. Peixe Lagoon fishers have established little interactions with fisher groups from nearby regions. I will analyse this lack of interplay between fisher communities in the subsection 5.5 of this chapter, which is concerned with missing linkages.

**Exclusive beach fishers** are those who have specialized in fishing in the sea, using similar equipments and techniques as the Peixe Lagoon beach fishers. Fishers form this group live mostly in four villages: *Praia Nova*, *Pai João*, *Veiana* and *Canhão*. The

estimated number of exclusive beach fishers is around one hundred and twenty. With exception of Canhão village, the other villages receive tourists during the summer and sportive fishers during the whole year, which gives them opportunities for having alternative sources of income such as house-watchers. The presence of tourists and sportive fishers also provides them good opportunities for selling their captures.

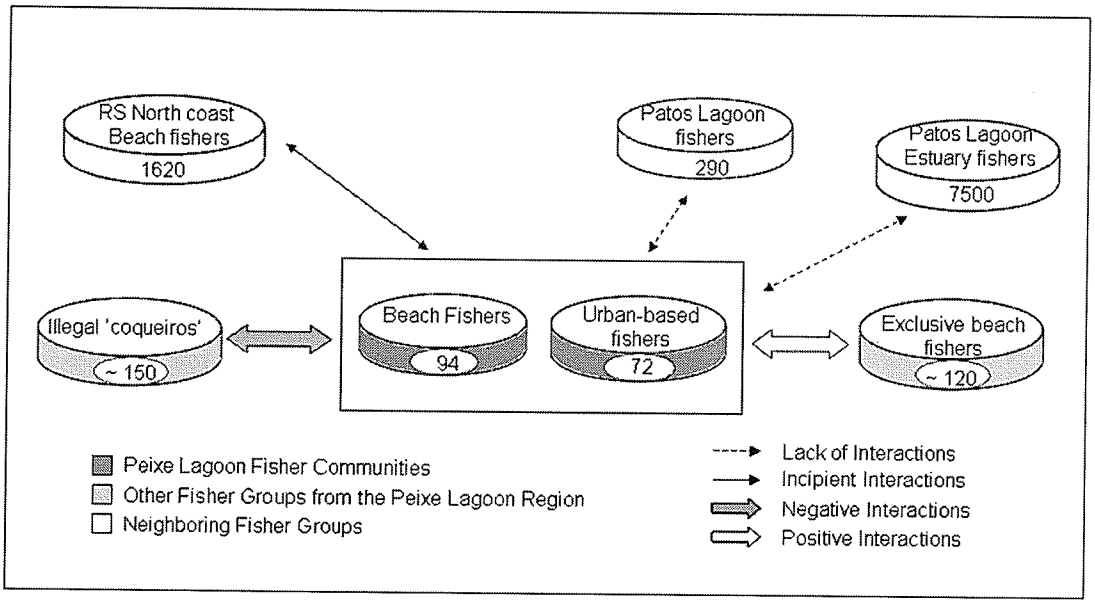


**Figure 20: Peixe Lagoon fisher communities' horizontal linkages**
(Numbers represent the amount of fishers in the groups. With exception of the local fisher groups, those numbers were provided in Garcez and Sanchez-Botero, 2005)

The interactions between this group and Peixe Lagoon fishers are quite scarce. These interactions occur mostly through the Fishers Association of Balneário Mostardense which administrates the Praia Nova fish storing house. As previously mentioned, some of the members of this association are Peixe Lagoon fishers. The association president participates in the National Park Advisory Council demanding attention to fisheries issues, which is also of the interest of Peixe Lagoon fishers. In addition to that, both groups exchange knowledge about the fisheries in the ocean, about chances for organization such as the creation of fish storing houses, and about market opportunities.

While interactions with exclusive beach fishers have not brought great advantages to the Peixe Lagoon fishers, they are at least positive. On the other hand, there exist a

group of illegal fishers which use forbidden manual drag nets (locally know as *coca*) to catch pink shrimp in the Peixe Lagoon. Those fisheries take place mainly during the period previous to the official opening of the season, when there are mostly juvenile pink shrimps in the Lagoon, i.e. in the period in which pink shrimps are smaller than the appropriate size for capture. Because illegal fisheries have been done with *coca* nets, these fishers have been called *coqueiros*. In fact, *coqueiros* are users of fishing resources but they have not been recognized as real fishers. Most of them are unemployed people who find in the pink shrimp season a way of having some income. There is approximately the same number of *coqueiros* and Peixe Lagoon fishers, according to the perception of the latter.

The impacts of the illegal fisheries are not only related to the capture of juvenile pink shrimps but also to the modification of the Lagoon's bottom. It is habitat for several species of plants, molluscs and crustaceans, including the pink shrimp itself. In addition, *coqueiros* have often been blamed to steal shrimps from the nets of the legal fishers. The latter denunciates illegal fisheries to the National Park staff but the enforcers are rarely able to catch a *coqueiro*. It happens because enforcers do not enter the Lagoon and because *coqueiros* use access paths hidden in the native vegetation where the enforcement vehicles can not go. Peixe Lagoon fishers seems to bear with *coqueiros* as they are needed people, but even when they feel strongly affected, they do not have any way of stopping them. Denunciating has become less usual as it can result in retaliation. As explained by a fisher from Farol village, "*Coqueiros somehow find out who denunciates them, and then they go and cut the nets of those who denunciate, or steal their shrimps or their lamps ... and there is a lot of coqueiros, and one tell it to the others*".

At the community level there are other groups of small-scale fishers in the Rio Grande do Sul State which have created linkages among themselves. Peixe Lagoon communities are just starting to have some interactions with one of those groups, which are the fishers from the north coast of the state, through a brand new regional fishing forum. Patos Lagoon fishers constitute the largest group of fishers in the state and have been involved in the co-management of the fisheries resources through a considerably

strong fishing forum. Opportunities for furthering connections with those groups will be described in the subsection 5.5 of this chapter.

### 6.2.2 **Strong vertical linkages**

Table 13 concisely presents the vertical linkages involving Peixe Lagoon fisher communities. I have classified those linkages as strong, moderate or weak according to my perception of the level of interaction the organizations have with the fisher communities. Strong interactions are those in which the fishers have a practically continual contact with the organization. The main activities and the maintenance of the fishers' rights depend on those interactions. Moderate interactions are those in which the fishers have almost a continual contact with the organization, but these interactions are not as important and frequent as strong interactions. Weak interactions are occasional contacts which usually does not have major influence over the fisher communities.

**Table 13: Level of interaction between organizations and fisher communities**

| | **Weak Interactions** | **Moderate Interactions** | **Strong Interactions** |
|---|---|---|---|
| **Local Organizations** | National Park Land Owners Association | Peixe Lagoon National Park Advisory Council | IBAMA |
| | | Municipal Governments (Tavares and Mostardas) | Peixe Lagoon Fishing Forum |
| | | EMATER | Fishing Labour Union Z11 |
| **Non-local Organizations** | Universities (FURG, URGS, PUC-RS, etc) | Federal Fisheries Secretariat (SEAP) | None |
| | Environmental Police | Federal and state governments | None |

***IBAMA***. This agency has had the responsibility of administrating the Peixe Lagoon National Park. Interactions between fishers and this institution have been the most relevant for them as it determines what they are allowed to do in their professional activities and at some point may determine their withdrawal from the protected area.

Brazilian small-scale fishers generally hold a negative view of environmental agencies, as they have been perceived as corrupt and inefficient (Pinto da Silva 2004). Despite of the predominant bad impression that local population have of the National Park administration, they almost unanimously have agreed that the presence of IBAMA in that region is necessary for environmental protection.

Fishers do not see themselves as the ones who should regulate access and create rules, but they expect that the environmental agency create those rules and enforce it. At the same time they also expect cooperation, justifications, alternatives, and equity. However the history of the PLNP shows little popular consultation and a lack of resources from the environmental agency to manage and enforce the protected area. In regards to the acceptance to the PLNP, a fisher's quote is quite explanatory: "*IBAMA arrived in the right moment, but in the wrong way*".

***Fishing Labour Union Z11.*** That is a labour union created and maintained by the federal government but currently administrated mostly by local fishers. It was created in 1984 and has around one thousand associates[5] who are fishers or fishers' wives from the central part of the Rio Grande do Sul coast. The main role of the labour union today is to provide documentation for the fishers, which is a requirement for them to have access to governmental benefits (e.g. pensions and unemployment salary).

The president of this organization has the attribution of representing fishers in events, and defending their interests in negotiations with other groups. The current president has been part of the administration body for 15 years, being 8 of those years as president. Although Peixe Lagoon fishermen esteem him, they have recognized that he lacks leadership and negotiation skills, and therefore there exist a problem of poor representation.

***Fishing Forum.*** The leadership and representative role that the Fishing Labour Union's president has left behind has been taken by municipal politicians, remarkably those who are involved with the Peixe Lagoon Fishing Forum. As explained before, the president of the Forum has been recognized by the Peixe Lagoon fishers as the one who

[5] Number provided by the Fishing Labour Union. It may be overestimated due to the considerable number of people who only associated to the labour union to get possible benefits (e.g. unemployment salary).

has better represented their interests and better struggled for their rights especially in negotiations with the National Park administration.

### 6.2.3 **Moderate and weak vertical linkages**

***Municipal governments***. In addition to the participation of municipal politicians in the Peixe Lagoon Fishing Forum, Tavares and Mostardas have secretaries for dealing with fisheries and agriculture issues. Although not many actions have been taken by these secretaries in terms of fostering discussions related to the fisheries or taking initiative for solving problems, these secretaries provide some support for the councillors who are active through the Forum.

In 2003 a group of municipal politicians together with the National Park Land Owners Association organised a protest parade with the support of other sectors of the civil society including the small-scale fishers. The protest was against the authoritarian policy of implementation of the National Park and also because of the indignation of local people in regards to truculent behaviour of the Park National staff local periodic (Jornal Freguesia das Águas 2003).

In that occasion between 3000 and 4000 people - in a city of slightly more than 5000 inhabitants - went to the streets carrying banners and shouting sayings of disapproval to the conduct of IBAMA. The parade counted with the presence of the main politicians and organizations representatives of the cities of Tavares and Mostardas. Although the IBAMA-RS State Executive Superintendent left the state capital to observe the protest, it did not lead to any considerable positive outcome.

***EMATER***. The relationship of this organization with the Peixe Lagoon fishers has been recognized by them as positive not only because of the technical assistance provided but also due to the participation of this organization in the multi-stakeholder bodies. EMATER staff helps to express the concerns of the fisher communities in a different 'language', i.e. using technical expertise. Getting funding and writing projects for the construction of fish storing houses, and assistance with creation of community-based organizations to administrate the FSPH have also been contributions of EMATER.

***SEAP***. It is a secretariat for fisheries with status of Ministry which was created in 2003. Before its creation, the fishery sector was under responsibility of IBAMA (Ministry of Environment) and Department of Fisheries and Aquaculture (Ministry of Agriculture). SEAP was created to concentrate the attribution of governing fisheries in only one organization that deals exclusively with fisheries issues. There is a SEAP-RS State office which has a closer contact with the local level and can better assess fishers' necessities. A former small-scale Patos Lagoon fisher has taken the responsibility of leading the state office and has been able to follow closely the condition of local fishers.

SEAP has got a representative to participate in the Peixe Lagoon National Park Advisory Council and has given opportunity to local fishers to elect some representatives (the so-called fishing agents) for listening claims at the local level and informing SEAP state office. Some village representatives have volunteered to the position but the community has not adhered to the idea yet. So far, the role of SEAP in the region has been limited to contributions in the discussions of the Advisory Council and to specific actions of assistance. An example of those actions is the provision of a tent with equipments that help fishers to sell their products directly to consumers (Figure 21).

***Federal and state governments***. Fishers recognize those as fairly positive actors for them. That is mainly due to the provision of an unemployment salary and funding programs. The unemployment benefit exists to compensate the fishers who are forbidden to exploit species legally protected during their period of reproduction. All the fishers who have valid fishing documents are able to get the benefit, receiving one minimum wage (R$ 380 – CAD $ 234 / month) during three or four months of the year, depending on the species they exploit. As explained by a fisher "*the unemployment salary is not much but helps us very much... it does not matter we are not allowed to fish during some months because fisheries in those months are scarce anyway*".

***National Park Land Owners Association***. It is composed by around four hundred farmers. Most of them plant onion or rice and raise cattle or sheep. Until the decade of 1970, fishers and farmers used to organize together the annual opening of the Lagoon mouth. This cooperative organization became unnecessary after the municipal governments started to send machines for opening the connection, and today these two groups practically do not take any joint action. This association has been struggling for

the rights of the land owners establishing political connections to support their requests. In 2006, the association sewed the National Park because of the losses farmers have had since the creation of the protected area and because they have never received any kind of compensation as stated in SNUC. Fishers were not involved in the process of sewing IBAMA.


**Figure 21: Fisher selling mullet with equipment provided by SEAP**

Fishers and farmers have some minor divergent interests related to the opening of the Lagoon mouth. For farmers the sooner the mouth is opened the better, because their grass fields do not become flooded (Figure 22), while for fishers the Lagoon must accumulate lots of water before its mouth is opened, according to their traditional knowledge. Despite minor disputes, fishers and farmers usually have the same position of defending the rights of local population over the authoritarian policy of implementation of the National Park. Farmers are different from fishers in the sense of being more likely to accept compensations for leaving the protected area as most of them do not depend anymore on those lands as their main source of income, contrarily to the fishers.

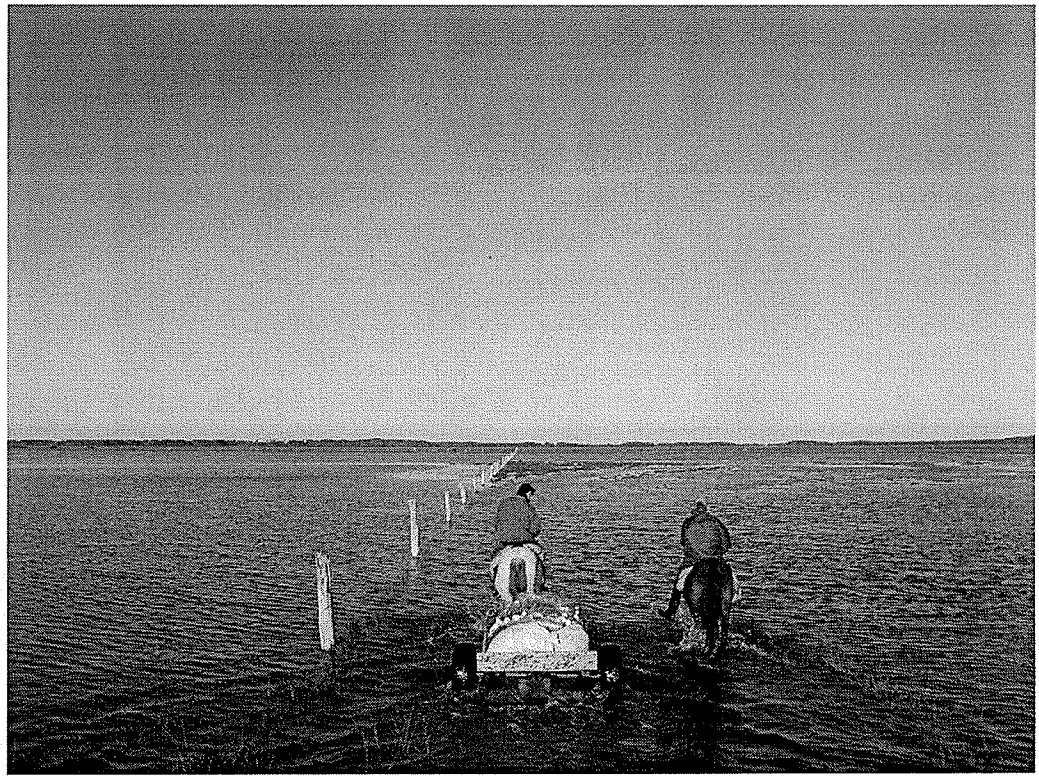

**Figure 22: Fishers passing through a flooded farm inside the National Park**

***Environmental Police***. It is a military organization for the enforcement of laws related to the environment and to support enforcement actions accomplished by environmental agencies. The branch office which is responsible for the Peixe Lagoon area is located in a coastal city around 200 km north. For this reason, Environmental Police Officers practically just go to Peixe Lagoon area when the National Park administration requires it. Similarly to IBAMA, the Environmental Police has a history of aggressive behaviour towards the local population.

***Universities***. Scientific researches carried out at the Peixe Lagoon region have been done mostly by academics from five universities from the RS State, namely FURG (Federal University of Rio Grande), UFRGS (Federal University of Rio Grande do Sul), PUC-RS (Catholic University of Rio Grande do Sul), UNISINOS (University of the Sinos River Valley) and UFPEL (Federal University of Pelotas). Researches have been done due to individual initiatives and not as programs established by the universities.

FURG was the only university broadly involved in the creation of the National Park. It was responsible for elaborating the National Park Management Plan and to update it one decade later. FURG also had a spot in the Peixe Lagoon Fishing Forum when it was created. In more recent years, the role of this university has faded, and individual researcher initiatives have been the only way FURG has been present in the Peixe Lagoon region. Some years ago UFPEL had a project for building ecologic houses for the traditional fishers to live in the protected area with minimum environmental impact, but it was not put into practice because the National Park administration considered it inappropriate.

Due to the facts that most of the researches are related to ecological issues, count with some support from the National Park staff, and are done by people from other cities, the local population consider universities as allied to IBAMA. Fishers relate that researchers usually stay little time in that region, ask for lots of information, and their researchers do not bring any benefit to the local population. In addition, fishers have the unanimous opinion that the National Park was created due to researches on migratory birds done in early 1980s. As explained by the following fisher quote: *"When the Park creators arrived here at the first time, they arrived like you. They said they were only looking at the birds, just doing research. They asked us questions, stayed in our houses and then went away forever. When we realized, officials appeared saying that a Park had been created and that soon everyone would have to leave".*

### 6.3 Invisible Linkages

In addition to those interactions which most of the interviewees were able to talk about, it was possible to detect connections among local and non-local organizations which I have called 'invisible linkages' because their existence and importance were not easily recognized at the local level. IBAMA, municipal governments and the National Park Land Owners Association are organizations which present that kind of connections.

IBAMA at the local level (i.e. the National Park administration) has connections with the IBAMA branch at the state level and at the federal level. The National Park administration must consult those higher hierarchical levels and account to them in certain cases, especially when dealing with delicate and unusual issues. In those situations officials from IBAMA at the state level may visit the Peixe Lagoon National

Park, as it happened in 2003 during the parade protest previously mentioned. Despite the unawareness of the communities at the local, those connections have a huge impact on them once the policies implemented in the National Park are at a great extent determined at higher political levels (Figure 23).

At the federal level, IBAMA has institutional linkages with the Ministry of Environment, as the latter have the role of determining environmental policies all over the country, including policies related to protected areas. One of the factors which influence the establishment of those policies is the existence of international treaties. The Peixe Lagoon National Park has been recognized as part of three international treaties: (1) Atlantic Forest Biosphere Reserve - UNESCO, (2) Wetland of International Importance - Ramsar Convention, and (3) Western Hemisphere Shorebird Reserve. Those are renowned international treaties for wildlife and environmental conservation, which reflects on the policies applied at the local level, likely influencing for the maintenance of a restrictive status of protected area.

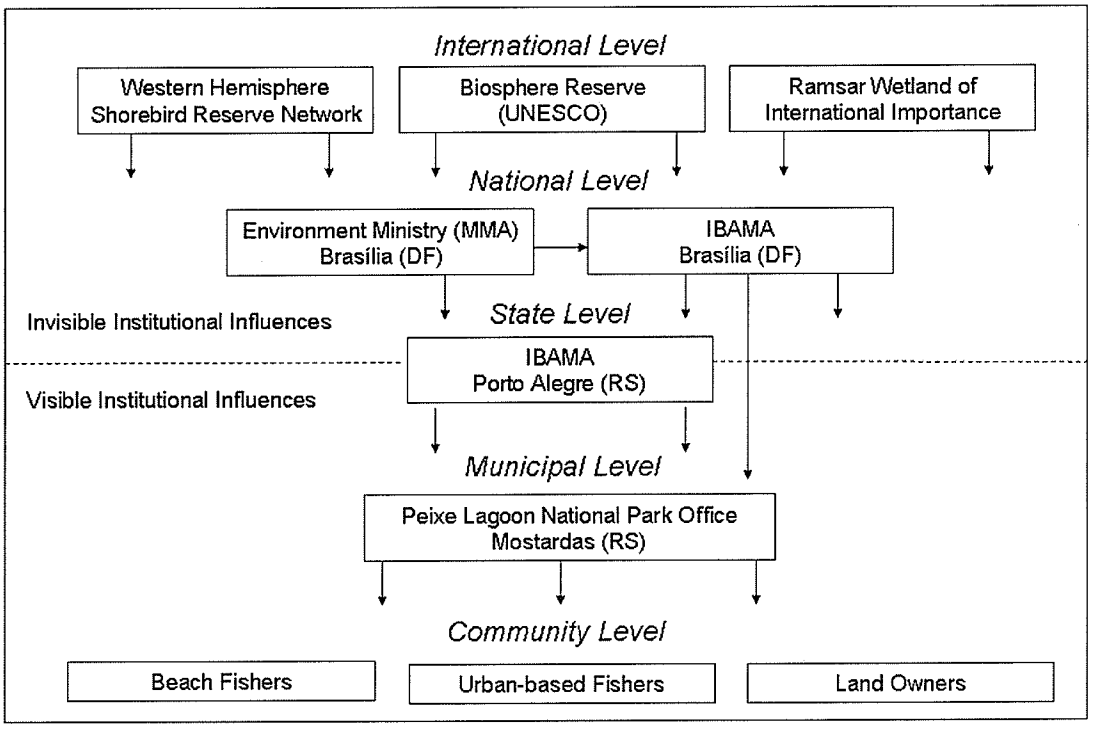


**Figure 23: Invisible institutional linkages influences on National Park management**

Municipal governments establish political alliances with their party fellows at the state and federal level. In specific cases, state and federal politicians are called for municipal politicians to participate in meetings in which important issues are negotiated with the National Park administration, strengthening their power of negotiation. For example, state and federal politicians supported local leaders in the organization of the protest parade which took place in 2003 and in following dialogues with IBAMA-RS Executive Superintendent and with the Federal Minister of the Environment.

The National Park Land Owners Association has a connection with the RS State Agriculture Federation (FARSUL) which is of great relevance. This federation provides technical assistance, legal orientation, and offer information and capacity building through courses and workshops. The interplay happens mostly through the participation of individual farmers and municipal farmers associations' representatives in events organized by FARSUL, and through direct consultations done every time it is necessary. As FARSUL has a considerable political power, it may intervene in favour of their associates in decision making processes as well.

### 6.4 Missing Linkages and Partnerships

In the context of natural resources management, partnership can be defined as an arrangement, and the actions resulting of it, in which two or more parties commit to maintain a mutually beneficial relationship. According to my perception of the interactions existing between the Peixe Lagoon fishers and other groups it can be argued that they have established no partnerships.

Although Peixe Lagoon fisher communities have a certain number of institutional relationships, none of them is strong enough and has the level of commitment to be considered a partnership. Nevertheless, it was identified a considerable number of opportunities for the establishment of interactions or partnerships with local and non-local groups, communities and organizations. There are also possibilities for improving existing interactions to become partnerships. Table 14 presents opportunities for the establishment of linkages or partnerships between Peixe Lagoon fisher communities and other groups below the municipal level.

At the local level there are clear opportunities for the fisher communities to create linkages which can develop to become partnerships with the Catholic Church and with Tourism entrepreneurs. The Catholic Church has taken the role of fostering community organization and empowerment in the Brazilian Amazon for the establishment of extractive reserves (Queiroz 2005b). In southern Brazil, a specific department of the Catholic Church has been important for assisting small-scale fisher communities, such as those from the Patos Lagoon estuary. This department is called *Pastoral da Pesca* meaning "Fishing Shepherd" and it has had a relevant role for the creation and development of fishermen associations for improving opportunities of fish commercialization.

**Table 14: Opportunities for the establishment of horizontal linkages or partnerships**
(The partnership functions as classified by Berkes and Adhikari 2006)

| **Partnership functions** | **Possible Partners** |
|---|---|
| Business networking | Tourism entrepreneurs |
| Institutions building, empowerment | Catholic Church (*Pastoral da Pesca*) |
| Innovation and knowledge transfer | Patos Lagoon fishers, RS North Coast and RS South Coast Fishing Forum |

Although fishers have difficulty in realizing it, Peixe Lagoon region has a great potential for tourism development, especially after the ending of the current process of paving the road which connects this region to the city of Rio Grande. Fisher communities and tourism entrepreneurs of Tavares and Mostardas could provide benefits for each other through the establishment of a partnership in which the fishers and their relatives could work as tourism guides. It could be used as a strategy for attract more eco-tourists for local hotels and inns while providing an alternative source of income for fisher families. Some of the money generated through eco-tourism could be captured by the Park management as well. Young people and other community members could be trained for working as park naturalists, bird watching guides, fishing guides outside the park, and for the protected area maintenance. Such occupations could give fisher communities alternative sources of income, allowing for decreasing pressure over fishing resources.

In regards to opportunities for furthering knowledge transfer and innovation, two regional fishing fora within Rio Grande do Sul State were recently formed, one in the south and other in the north coast. Peixe Lagoon fishers are located in the central coast of that state and have not engaged in any of those fora. Actually, representatives of the Peixe Lagoon Fishing Forum and from the Fishing Labour Union Z11 have just started participating in some meetings of the RS North Coast Fishing Forum, which may encourage the community itself to get interested as well.

There is also opportunity for learning with Patos Lagoon estuary fishers, which is the largest group of fishers in the state, and is located pretty close to the Peixe Lagoon region. Patos Lagoon fisher communities have considerable experiences in dealing with lack of organization and underdevelopment problems. Knowledge exchange between these communities would help Peixe Lagoon fishers to become aware of ways that have been used for dealing with common issues.

In addition to opportunities for partnership building with other fisher communities and local organizations, there are also a considerable number of opportunities for the establishment of vertical linkages with universities, the private sector, governmental and non-governmental organizations (Table 15).

EMATER is the only of the organizations listed in this table that currently have relevant interactions with the Peixe Lagoon fishers. Nevertheless, those interactions could be enhanced through a variety of manners, once it is not out of the EMATER attributions to provide capacity building for small-scale fishers in what regards, for example, formation of community leaders and institutions building.

NEMA is an environmental NGO from Rio Grande city, which was involved with the National Park in its first years of existence. They had a partnership with the National Park administration for developing a program of environmental education with the local population, focusing especially on children. After that initial work, NEMA decreased their activities in this region and currently their role in the Peixe Lagoon region is limited to the monitoring of turtles and mammals found in the coast line, participation in the meetings of the National Park Advisory Council and eventual projects in partnership with the National Park administration. A fisher from Farol village explained how they feel about that: "*A NEMA officer used to come here and say that they were looking for*

*alternatives for the fishers. After that we never saw him again, and neither his alternatives*".

Due to past experience, when a NGO employee arrives in Peixe Lagoon region, fishers use to comment with each other that "*there comes another IBAMA*". Currently, there are four NGOs participating in the National Park Advisory Council but with minor or no contributions for the fisher communities.

**Table 15: Opportunities for the establishment of vertical linkages or partnerships**
(Partnership functions as classified by Berkes and Adhikari, 2006)

| **Partnership functions** | **Possible Partners** |
|---|---|
| Fund-raising | Agency for Technical Assistance and Rural Extension (EMATER), NGOs |
| Training / research | Universities, National Centre for Sustainable Development of Traditional Populations (CNPT), CNPCT |
| Institution building | EMATER, CNPT, NGOs, National Commission for the Sustainable Development of Traditional Populations and Communities (CNPCT) |
| Legal support | CNPT, CNPCT |
| Knowledge transfer | Universities, NGOs |
| Business networking | Tourism sector, National Government Agency of Supply and Services (CONAB), EMATER |
| Empowerment and equity | NGOs, CNPT, CNPCT |

In the same way as NGOs, those universities which have interest in the Peixe Lagoon region could establish long-term programs for community development and for increasing knowledge about the local environment and possible management strategies. Financial management, participatory research and management methods are examples of areas in which NGOs and Universities agents can contribute (Pinto da Silva, 2004). Universities could have a major role in promoting knowledge exchange between

researchers and the local population as well. The establishment of long-term projects would facilitate the creation of rapport with the community and the development of activities that could meaningfully address their aspirations and concerns.

The National Centre for the Sustainable Development of Traditional Populations (known by the acronym CNPT) is a department of Instituto Chico Mendes created for elaborating and implementing projects required by traditional populations such as indigenous, extractive and fisher communities. CNPT has also the attribution of supporting and preparing communities for participating in co-managed protected areas such as Extractive Reserves and Reserves of Sustainable Development. The only and major barrier for CNPT to work with Peixe Lagoon fisher communities is that this organization is supposed to work in protected areas which allow for the presence of traditional population, which is not the case of National Parks.

The same barrier does not apply for the National Commission for the Sustainable Development of Traditional Populations and Communities (known by the acronym CNPCT). This commission, created in the 2006, is formed by government and representatives of several traditional communities and has the main function of promoting the development of those communities considering the principles of environmental sustainability. Another attribution is to minimize or solve conflicts generated by the implementation of 'no-take' protected areas in traditional territories (Brazil 2007 - Decree 6040/07). As the creation of CNPCT is very recent, there are still no documented examples of how it has worked for fulfilling its attributions.

The lack of interactions between the fisher communities and the National Government Agency of Supply and Services (CONAB) is an important missing linkage identified. The main role of CONAB is to promote programs destined to deliver funds for projects which help rural producers to get better opportunities for commercialization of their products. Two of those programs which apply for Peixe Lagoon fishers communities are the Program for Food Acquirement and the Program for Stock Formation.

The first program has the objectives of guaranteeing commercialization of products from rural communities and supplying food for populations in a situation of difficult food security. Through this program, CONAB establish a commitment for

buying the production of rural communities, and subsequently distribute those products for needed populations (CONAB 2004). The second program was created to help rural communities to have better conditions for commercializing their products. Through this program, CONAB makes available funding for allowing the communities to form stocks of their products for posterior commercialization (Brazil 2008). Although Peixe Lagoon fishers fulfill the requisites for the implementation of both programs, community representatives have not taken the task of contacting CONAB and make the arrangements for those programs to be carried out.

# Chapter 7 - Factors that facilitate participatory management

## 7.1 Identification of Positive Factors for Participation

A number of factors have been identified as facilitators for the establishment of a meaningful participatory approach for the management of the Peixe Lagoon protected area. Those factors are (1) existence of multi-stakeholder bodies for decision-making, (2) fishers participation in researches for the opening of the pink shrimp season, (3) existence of traditional ecological knowledge and management strategies, (4) fishers willingness to assist for protected area management, and (5) relative small size and homogeneity of the communities.

### 7.1.1 **Existence of multi-stakeholder bodies for decision-making**

The existence of the Peixe Lagoon Fishing Forum since 1998 and the recent creation of the Peixe Lagoon National Park Advisory Council are important steps towards a more participatory approach. They are already existing platforms for negotiation and have the potential to develop low-cost effective conflict-resolution mechanisms. Despite these multi-stakeholder bodies could still improve in several ways, the simple fact that they exist represents a concrete opportunity for improving the interactions among stakeholders and establishing a meaningful participatory approach for protected area management. For participation to be meaningful, fishers should be enabled and prepared to negotiate with the National Park administration at the same level. In addition, they should be allowed to have some independence when taking decisions, i.e. some power should be transferred from IBAMA to the fisher communities.

By establishing the Fishing Forum and the Advisory Council, the National Park administration has argued to be implementing a participatory approach. However, many of the so-called 'participatory processes' have been a kind of 'ritual' in which power-holders claim that all parties were considered but, in fact, only some of the groups are benefited (Ericson 2006). Public participation is an idea vigorously applauded by almost everyone, but in the practice it may serve just as a means for the power-holders to legitimate their decisions without really sharing the power of doing so with the grassroots level. Through the analysis of different levels of participation, from the 'manipulation

rung' to the 'citizen control rung', Arnstein (1969) demonstrated how diverse processes called as public participation can be.

In my opinion, the multi-stakeholder bodies of the Peixe Lagoon National Park present a mix of some of the most basic levels of participation presented by Arnstein. In those levels, there is no genuine public participation. "People are placed on rubberstamp advisory committees or advisory boards for the express purpose of education them or engineering their support" (Arnstein 1969, 4). In a more optimistic point of view the citizens may be truly consulted but without any guarantee that their concerns or opinions will be taken into account.

The concept of participation has often been imprecisely defined and applied with no rigor (Little 1994). The existence of several levels of participation implies that the utilization of the terms such as "participatory approach" or "public participation" must be critically addressed, and must not be accepted without proper qualification (Pimbert and Pretty 1997). Processes of public participation must define clearly the objectives of including people in decision-making, be it for information gathering or for building capacity and empowering communities (Ericson 2006). The difference between the current participatory management in place in the National Park and a more meaningful model is that the former one does not have the objective of transferring power to local people in such a way that allows them to determine the direction of their own lives.

### 7.1.2 **Fishers participation in researches for the pink shrimp season opening**

Since the year 2000, decisions related to the opening of the pink shrimp fisheries have been done through a research done with the participation of the local fishers (Figure 24). This process began with a PhD student which were hired by the National Park administration for carrying the research out, and in the last two years officials from the National Park has taken responsibility over this task. The fishers participate by collecting pink shrimp samples in every sector of the Lagoon and accompanying the researchers in the measurement of each collected individual. The fishing season is opened separately in each one of the eight Peixe Lagoon sectors as soon as 70% of the collected pink shrimps are higher than 9 centimetres. This process has allowed information exchange between

researchers, National Park staff and local fishers. It has also made fishers become more used to contribute with external agents, trust their job and respect their decisions.

### 7.1.3 **Existence of TEK and management strategies**

The traditional ecological knowledge held by Peixe Lagoon fishers and their related resource management strategies are relevant assets existing for protected area management. The knowledge involved in the day-to-day activities of the fisherfolk is closely related to the Peixe Lagoon and adjacent coastal ecosystems as they depend directly upon these environments for survival. The routine of the local population and their fishing practices are shaped by and largely adapted to local environmental conditions such as wind and rain regimes and depth of the Lagoon (Almudi and Kalikoski, submitted).

**Figure 24: Researcher and fisher examining shrimp catch**

Peixe Lagoon fishers' knowledge is especially rich in what relates to the weather, species life cycles and their relationships with other living beings and with the local ecosystems. They have detailed knowledge on local fishing species behaviour and

lifecycle, and on the temporal variation of their abundance. As previously mentioned, management strategies have been applied for centuries by the local population, such as the annual opening of the Lagoon's mouth, allowing for the maintenance of the ecological processes of the region, including the availability of food for most species of migratory birds. The identification and promotion of social practices which enhance biodiversity and maintain livelihoods at the same time is a central feature of participatory approaches for conservation (Pimbert and Pretty 1995).

Planning for the management of protected areas should start with what is well known by the local resource users. This is a rich source of information which should not be wasted in any case (Pimbert and Pretty 1997). The recognition and strengthening of existing local institutions for the control of resource use may also be the starting point for building of more sound environmental conservation (Seixas 2006a, Kalikoski *et al.* 2006). Table 16 contains a resume of resource management strategies devised by Peixe Lagoon fishers, as well as other actions which demonstrate some level of community organization and connections with other groups.

**Table 16: Actions demonstrating organization involving fishers**

| Actors | Kind of action | Action | Brief description | Years |
|---|---|---|---|---|
| Actions by fishers only | Resource Management | Beach fishing spots control | Fishers protect their own fishing spots | Since the 80's |
| | Resource management | Fishing spots control in the Lagoon mouth | Fisher protect their own fishing spots | Since the 80's |
| | Resource management | Lagoon mouth annual opening | Knowledgeable fishers indicate the way to open it | Since 19th century |
| | Resource management | Closing in the pink-shrimp season | Voluntary closure for two weeks | 2001, 2002 and 2004 |
| | Resource management | Fishing pink-shrimp without using lamps | Experience for decreasing undesirable catches | 2006 |
| | Protest | Bridge blockade | Fishers required the opening of the pink-shrimp season | 2002 |
| Joint actions | Resource management and protest | Lagoon Mouth opening without IBAMA permission | 70 fishers and farmers opened it with spades | 2004 |
| | Protest | Popular parade to protest against the National Park | Organized by local politicians and land owners. | 2003 |

Sensitivity to local knowledge and institutions has not only the potential for improving resource conservation strategies but also for reducing the social impacts of the implementation of such strategies, minimizing unintended outcomes and sources of malfunctions (Lane and Corbett 2005). However, it is necessary that the health of those institutions and its impacts on the resources be evaluated before officialising them. For the good of conservation purposes, its practitioners should not presuppose that traditional systems are always equitable, fair and up to date (Pinto da Silva, 2004).

### 7.1.4 **Fishers willingness to assist for protected area management**

Fishers have demonstrated - as it can be seen in Table 17 - that they initially would be willing to contribute for the well functioning of the protected area at least in three ways: enforcement through anonymous denunciations, monitoring/research and decision-making. This table is based on quantitative interviews done with 36 fishers from both communities, corresponding to 22% of the total of Peixe Lagoon fishers.

**Table 17: Activities in which fishers would like to contribute for environmental conservation**

| Activities / Community (n.a. = no answer) | **Urban-based (*n* = 11)** | | | **Beach fishers (*n* = 25)** | | | Positive answers |
|---|---|---|---|---|---|---|---|
| | yes | No | n.a. | yes | No | n.a. | |
| Enforcement (as official enforcers) | 0* | 91 | 9 | 8 | 80 | 12 | 4 |
| Enforcement (anonymous denunciation) | 73 | 18 | 9 | 80 | 12 | 8 | 76 |
| Research and monitoring | 82 | 0 | 18 | 88 | 4 | 8 | 85 |
| Decision-making | 82 | 9 | 9 | 88 | 4 | 8 | 85 |

* Numbers presented in percentage

Most of fishers clearly do not think they could be work as official enforcers (park-guarders). That is because they would not like to quit fishing for working as enforcers, and because, as explained by a fisher, "*in this region everybody knows each other, so it would be difficult to me to arrest my neighbours or relatives*". On the other hand, anonymous denunciations through telephone have already been done by them, especially related to the presence of the illegal use of dragnets by *coqueiros* which occurs before

and during the opening of the pink shrimp season. According to interviewed fishers, denunciated illegal fishers have many times been able to somehow figure out who made the denunciation and carry out some kind of retaliation, such as damaging nets and boats and robbing fishing equipments.

Traditional fishers would like to assist the National Park staff to enforce the established rules through a mechanism which allows them to be protected from possible retaliations. An initial step for that is the establishment of an agreement between the National Park administration and fishers with guarantee of confidentiality about the identity of the person who denunciates.

Participation in researches and monitoring of environmental variables is seen by fishers as a viable way of assisting the National Park well functioning. In fact, fishers have already participated in many ways in those activities. In addition to accompanying and collecting samples for the research which determines the opening of the pink shrimp season, fishers have provided significant contributions for researches done in this area. Researchers usually rely on the logistical support provided by fishers for collecting samples as well as on the volunteer work provided by fishers for collecting material, monitoring and taking notes about species behaviour or environmental parameters. Their local and traditional knowledge has also been an important source of information for investigations on local species of crustaceans, fishes and birds (for examples see Resende and Leuweenberg 1987, Resende 1988, Loebmann 2004, Loebmann and Vieira 2006).

As previously demonstrated, a great percentage of fishers are keen to participate in decision-making in what concerns fisheries management but not so much in what concerns other subjects (Tables 10 and 11). Therefore the high number of fishers willing to participate in decision-making, as showed in Table 17, must be related to their aspirations to keep participating in fisheries management. They consider their knowledge as relevant for establishing the rules related to fishing in the protected area and participating in the establishment of those rules is for them a toll for avoiding the establishment of regulations which severely threaten their livelihoods. As demonstrated in Tables 10 and 11, a certain number of fishers would be willing to participate in the National Park management in a broader manner as well. They realize that the management of aspects other than fisheries may influence indirectly their livelihoods, and

that their specific knowledge – especially those related to the historical changes occurring in the region - may be worth for taking decisions.

### 7.1.5 **Relative small size and homogeneity of the communities**

According to Ostrom (1990), groups of resource users which are not to large, allowing for certain homogeneity in terms of having little conflicting interests, are more likely to establish management strategies that work. Therefore, it can be argued that Peixe Lagoon communities have good chances of developing successful management strategies. They constitute one of the smaller fisher groups in the Rio Grande do Sul State (Garcez and Botero-Sanchez 2005), are fairly homogeneous in regards to local culture, fishing technologies in use and other aspects. Empirically, comparing the group of less than 200 Peixe Lagoon fishers with the group of around 7500 Patos Lagoon fishers located just some kilometres in the south, one can realize that less resources and energy would be necessary for assisting the smaller group to organize and to be engaged in resource management.

In addition, the problem of exclusion of resources users, in its more relevant part, has already been solved with the creation of the protected area. The exclusion issue is one of the aspects which make the management of common resources tricky. Community-based conservation endeavours are more likely to succeed if the local resource users enjoy exclusive rights of access to resources (Berkes 2007a). Despite there are still illegal resource exploitation inside the protected area, most of the outsiders who used to come annually to this region for taking advantage of the pink-shrimp season have been obstructed by activities of the environmental agency.

## 7.2 Factors that Require a Participatory Approach

In addition to the factors that facilitate participatory protected area management, there also exist relevant factors that require the development of a participatory approach for solving current problems. Those factors are (1) timely unavailability of resources for relocating and compensating local population according to the Brazilian protected areas legislation (SNUC), (2) rights of the local people to maintain their culture and livelihoods, (3) lack of resources for protected area management and enforcement; and (4) high dependence of most fishers on fisheries inside the protected area.

### 7.2.1 Unavailability of resources for relocation and compensation

According to the Brazilian Law for Protected Areas - Law 9985 / 2000 (SNUC), article 42: "Traditional populations which live in conservation units **(i.e. protected areas)** where their permanence is not allowed will be compensated for their possessions and appropriately relocated by the Public Power in a place and conditions agreed between the parties" (the text in Bold was added). In complement, Decree 4340/02 – Chapter IX, article 35 states that: "The compensation process mentioned in the article 42 of the Law 9985/00 will respect the ways of living and the sources of subsistence of the traditional populations". And article 39 of the same decree adds that "While they are not relocated, conditions of permanence of the traditional population in conservation units of integral protection will be regulated by a compromise term... which ensures the access of the populations to their sources of subsistence and the conservation of their ways of life"[6].

As National Parks in Brazil are 'no-take' protected areas, the local population inhabiting the Peixe Lagoon National Park should be relocated, according to SNUC. Instead of that, since the creation of the Park IBAMA has pressured the traditional fishers to leave the protected area and restrained their ways of living without any compensation. Adomilli (2002) affirms that since the Peixe Lagoon National Park administration has been concerned with the environmental impacts caused by small-scale fisheries, those fishers have been stimulated to leave their territory without any guarantee of assistance.

Therefore, the government has not been able to comply with legislation and to act according to its principles of social justice. According to the Brazilian Environment Ministry, more than a half of the protected areas in the country require some land-tenure regularization (Silva 2005), which is partly explained by the large financial costs of relocation. A viable solution for this issue, in the case of the Peixe Lagoon, would be to switch the designation of protected area for one that allows for the traditional populations to maintain their culture and livelihoods inside the protected area, such as Extrative Reserve or Sustainable Development Reserve (Box 2). The financial resources which would be used to enforce community relocation, and to provide alternative incomes, could be used for environmental protection, management and recuperation.

[6] Translation done by myself.

### 7.2.2 **Rights of local people to maintain their culture and livelihoods**

Switching the status of protected area for allowing the traditional population to maintain their culture and livelihoods would be in accordance with the objectives and guidelines of SNUC and important international conventions (Table 18). The objectives of SNUC (Law 9.985 / 2000, art. 4) include "protecting the natural resources necessary for the subsistence of traditional populations, respecting and valorizing their knowledge and culture, promoting them socially and economically". The article 5 of SNUC determines its guidelines, stating that the implementation of the law must "make sure that local population effectively participate in the creation, implementation and management of the conservation units" and "consider the conditions and necessities of the local populations in the development and adaptation of methods and techniques for the sustainable use of natural resources".

**Box 2: Protected area status that allow for the presence of traditional populations**

According to SNUC - **Extractive Reserves** (RESEX) have the basic objective of protecting the livelihoods and culture of traditional population ensuring the sustainable use of natural resources. **Sustainable Development Reserves** (RDS) have the basic objective of preserving nature while ensuring conditions for the reproduction and improvement of the livelihoods and quality of life of traditional populations. Both of these designations must be steward by a Deliberative Council composed by the environmental agency in charge, organizations of the civil society and of the traditional population inhabiting the protected area. Currently there are 82 RESEX and 15 RDS established in different environments across Brazil (Kalikoski *et al.* 2006). According to Queiroz (2005), RDS has been an exceptionally successful protected area model. SNUC also allows for the establishment of Mosaics of protected areas, where different models coexist side by side for serving multiple purposes. RESEX and RDS are models which fit the Category VI proposed by the IUCN (1994) Guidelines for Protected Areas.

### 7.2.3 **Lack of resources for protected area management and enforcement**

In the developing world the collaboration of local people for the implementation of protected areas is especially important due to the limited lack of political and financial support faced by environmental agencies (Solton and Duldey 1999, Pinto da Silva 2004). Brazilian environmental agencies have a history of lacking human and financial resources for dealing with environmental problems and enforcing the law (Silvano *et al.* 2006, Castello 2004). This results in a chronic problem of lack of capacity for maintaining, managing and enforcing protected areas, with issues of illegal exploitation and uncontrolled use of the natural resources (Medeiros, 2004; Silva *et al.* 2005).

Such problems have led to serious restrictions for the well functioning of protected areas all around the country, including issues of lack of compliance to management plans and inability to avoid illegal activities. Similarly, Garcez and Botero-Sanchez (2005) have identified an issue of inefficient enforcement of fisheries in the Rio Grande do Sul State. The Peixe Lagoon National Park has not been an exception to the trend of lack of resources for protected area management and failing enforcement.

The presence of illegal industrial vessels all year long in the area of the National Park and the existence of *coqueiros* who rarely are caught by the enforcers are examples of the necessity to establish partnerships for a more efficient protected area management and enforcement. The cost of managing protected areas is too high when local communities are not involved in the environmental protection (Pimbert an Pretty, 1997). Kareiva (2006) argues that the imposition of access restrictions to coastal resource users, without local support, has led to the establishment of 'marine paper parks'.

Environmental agencies which exclude local population of their agendas not only lose possible partners but also gain numerous adversaries. Experience has showed that local resource users not only circumvent legislation for fulfilling their necessities, but also they may act as "enemies of conservation" when perceiving they have been treated with injustice (Ballint 2006). Protected areas surrounded by unsatisfied and needed people will most likely fail to reach its objectives (Dowie 2005). On the other hand, participatory arrangements allow for volunteerism, collaboration and shared responsibilities for conservation. In those cases, the protected area manager can count with voluntary compliance and sympathetic cooperation (Lane 2001).

**Table 18: International instruments related to traditional populations**

| Instrument | Scope |
|---|---|
| Convention 107 International Labor Organization - ILO (1957) | - Right of owning the lands traditionally occupied (art. 11).<br>- They shall not be removed from those lands without their free consent except for reasons of national security, national economic development or for the health of those populations.<br>- When removal is necessary they must be relocated in lands of quality at least equal of those previously occupied<br>- Removed people shall be compensated for losses or injuries (art.12). |
| Convention 169 - ILO (1989) | - Their social, cultural and religious values shall be protected, and the integrity of their practices and institutions shall be respected.<br>- They shall be consulted through their representative institutions when measures may directly affect them.<br>- Right of owning traditional lands shall be recognized.<br>- Rights of using and managing natural resources in their lands<br>- They shall not be removed from their lands without their consent . |
| Agenda 21 – Chapter 26 (1992) | Governments should aim at fulfilling the following objectives:<br>- Empower indigenous people and their communities.<br>- Recognize their values and resource management strategies.<br>- Enhance capacity-building to ensure their sustainable development.<br>- Strengthen their active participation in the formulation of policies. |
| Resolution 1.53 – IUCN (1996) | The implementation of protected areas must:<br>- Be done with the agreement of the traditional land dwellers.<br>- Recognize their rights related to territories and resources use.<br>- Incorporate them in decision-making related to protected areas. |
| 1st Latin American Congress on National Parks and Protected Areas (1997) | - When protected areas are superimposed on indigenous lands, their rights to own their lands and using its resources must be respected.<br>- Recognition of their role in environmental preservation.<br>- Resource management must take into account the need to make human presence compatible with biodiversity protection. |

In the Brazilian Amazon, for example, IBAMA has given opportunity for community volunteers to have the power and responsibilities of official enforcers. After a process of training, the so-called Volunteer Environmental Agents become responsible for ensuring compliance with the fishing agreements locally devised (Ruffino 2001, McGrath et al. 2005).

### 7.2.4 **High dependence of most fishers on fisheries inside the protected area**

The fact that most of the traditional fishers depend exclusively on fishing inside the protected area for making a living makes it particularly difficult for the environmental

agency to relocate them in appropriate conditions. Moreover, relocating this population is not only unnecessary but also costly and complicated as it can causes many other issues due to the unwillingness of the local communities to spontaneously leave their territory.

Traditional fishers have a low level of formal education and their professional abilities are essentially related to the fisheries. Relocating rural-based communities in urban areas is a delicate task, as they become vulnerable to the lack of employment and can easily become socially marginalized (Arruda, 1997). On the other hand, relocating traditional fisher communities for other rural areas usually raises the risk of harming the habitats to where they were transferred (Colchester, 1997). Occupying a new area would require some kind of preparation for the establishment of dwellings, and the natural resources of that area would necessarily be exploited by the new inhabitants.

In both cases, their social structures and cultural life would likely be severely damaged. The end of an array of economic, social and religious activities related to the region where traditional communities used to live is likely to cause social disintegration and a socio-cultural distress which increases even the incidence of physical diseases among the relocated people. A multidimensional stress is created, including anxiety for the future and a feeling of impotence associated to the incapacity of protecting themselves and their community (Diegues 2000).

The lack of human and financial resources for appropriate management of the National Park allied to the necessity of the traditional population to use Peixe Lagoon resources for livelihood makes the implementation of a no-take protected area risky and problematical. If this continues to be the policy implemented in the Peixe Lagoon, there is a major chance of consolidation of another "paper park" in which the imposed institutions are formally recognized but beyond the capacity of authorities to administrate (Jones and Burgess 2005).

# Chapter 8 - Factors that hinder participatory management

There exist a considerable number of factors which currently hinder the implementation of a meaningful participatory approach for the management of the protected area established in the Peixe Lagoon region. Some of these factors are internal to the fisher communities while others are caused by external drivers. They are not always totally distinguishable as external factors may affect community's characteristics and vice-versa. The presentation and analysis of such factors is the purpose of the present chapter, together with the examination of possible solutions for them. This chapter ends with a brief comparison of the difficulties encountered for the establishment of a participatory management in the Peixe Lagoon region and the issues found in other Brazilian cases.

## 8.1 Internal Factors

The main factors internal to the communities which would currently hinder the establishment of a participatory arrangement for protected area management are (1) Peixe Lagoon fishers are not a monolithic entity, (2) Difficult community organization, (3) Lack of trust and self-confidence, (4) Community mindset not quite appropriate for participation and (5) Lack of basic relevant knowledge. This sub-section presents a discussion about these factors with considerations on possible solutions for them, as summarized in Table 19.

### 8.1.1 **Peixe Lagoon fishers are not a monolithic entity**

Communities are rarely homogeneous, being usually formed by different sub-groups and individuals with diverse interests and word-views (Berkes 2007b, Carlsson and Berkes 2005). These sub-groups may be separated by innumerable factors such as age, gender, social status, economic condition and different ways of resource use. The most visible, and possibly the most important, division among Peixe Lagoon fishers is the presence of two communities (beach and urban-based) competing for the same resources.

**Table 19: Internal factors hindering participatory management**

| Factors | Recommendations for solution |
|---|---|
| Peixe Lagoon fishers are not a monolithic entity | Empowerment of weaker groups; focus on common interests of all sub-groups, as incentive for collaboration |
| Weak community organization and leadership | Capacity building for organization, institutions and leadership; legitimization of the existing local institutions by authorities |
| Lack of trust and self-confidence | Joint projects, learning-by-doing for knowledge exchange and reciprocal trust building |
| Fishers not used to participatory mgmt | Participatory projects to develop skills and working relationships; incentives to participate by increasing benefits |
| Lack of basic knowledge about laws and fishers' rights | Empowerment through information; establish a process of knowledge exchange between fishers and other stakeholders; capacity-building |

As previously mentioned, one community is formed by fishers who work practically only in the Lagoon, have alternative temporary income and inhabit cities, while the other community is formed by fishers who work both in the Lagoon and in the sea, do not have alternative sources of income and inhabit the beach. The existence of conflicting interests between these communities threatens the establishment of a participatory management as it hinders the ability of the Peixe Lagoon fishers to defend their points in face of the governmental policies.

Other subdivisions are possible to be made by selecting other factors. For example, 16% of the fishers with official permission for working in the National Park are women (i.e. there are 26 fisherwomen). Fishers` children can also be considered as another sub-group within the communities that has not been recognized by the National Park administration.

Lane and Corbett (2005) argue that, despite community-based environmental management has been acknowledged to be more democratic, it not rare fails on considering the diverse knowledge and interests existing inside the communities. It can

actually strengthen and perpetuate power relations, formalising the power of stronger individuals or groups inside the community while leaving the less favoured outside the decision processes. For tackling this issue it is necessary to identify whether there is some group which have not been included in the decision-making process. It is also necessary to check if the decisions that have been taking have favoured more some groups in detriment of others. Empowerment of all groups would facilitate reaching the objective of creating equal conditions for all individuals to obtain fairly similar benefits from the use of resources. That is especially applicable for young, woman and less formally educated fishers.

Empowerment in this context is primarily related to the capacity of the community to influence its own future. It can be furthered through capacity building for organization, provision of technical assistance and information, increasing in the level of education, and opportunities for the community to provide inputs for decision-making processes which affects them. For Silva *et al.* 2005, empowerment and community well-being are closely related. They argue that empowerment can be achieved by the involvement of people in programs which improve their conditions of life, such those concerned with health and education.

The process of empowerment must be carried out together with a process of cohesion building in which the different groups are leaded to understand the positive outcomes of mutual collaboration. Common objectives must be focused at a first stage, making the different groups come together and view themselves in the same side of the equation. After that, divergent interests could be addressed through the "help to be helped" point of view. In this sense, local leaders would be extremely important for creating among the fishers the perception that both groups may benefit from each other's assistance, and that the current level of competition weakens both communities' ability to negotiate with external organizations.

### 8.1.2 **Weak community organization and leadership**

As demonstrated in the Chapter 4, Peixe Lagoon fisher communities are poorly organized. Fishers in general are little motivated for acting in group and demonstrate to have lack of trust on other fishers from the same or from a different community. They

have little information about their rights and about possible ways of modifying the problems their communities have currently faced. Individual interests predominate over common interests and, despite a few fishers could be considered as leaders, they are mostly not recognized as such, and have had low ability for mobilizing their community fellows.

There are cases in which communities self-mobilize for defending their interests, including those of conserving their lands and its resources. Strategies for defending common interests may begin with an initiative of approaching agencies for financial and technical assistance. Those communities are usually highly motivated and organized, and present a high level of cohesion and strong local leaders (Jeanrenaud 1999).

In contrast, no organization was created to represent specifically the communities of Peixe Lagoon fishers and to defend their interests. And those organizations which could have helped those communities (such as the Fishing Labour Union Z11) have had a limited role. In addition, the possible environmental benefits of fishers' management strategies were not recognized by the National Park administration.

Poorer and disadvantaged groups within society often bear the costs of conservation projects having few possibilities to struggle for their interests (Jeanrenaud 1999). The first step for solving this issue would be achieved if the government formally recognized the existence and importance of those fishing practices. In addition, fostering new institutions of resource users at the local level may be an efficient way of enhancing the capacity of the Parks administration to tackle environmental problems (Kalikoski *et al.* 2002).

Additional steps for solution could include the building of capacity for organization and formation of leaders within the communities. Fishers would be better prepared to be engaged in participatory management if they were empowered by learning organizational skills and if they had leaders who represented their interests in face of the environmental agency's policies. The existing leaders could receive training for assessing the needs, aspirations and concerns of their communities, and for involving their fellows in negotiation processes with other stakeholders. As important would be providing financial means for leaders to accomplish their tasks, and remuneration for compensating the fishing days lost for working for community benefit. Even after those first steps,

Balint and Mashinya (2006) suggest that because of local institutions are usually fragile they should receive continual external support for the establishment of successful participatory arrangements.

### 8.1.3 **Lack of trust and self-confidence**

Beyond not trusting the environmental agency and not trusting fishers from different or from the same community, individual fishers demonstrate to have little trust in what themselves are able to do for improving their lives. This is a subtle issue which could be easily overlooked but must have major implications for the success of participatory endeavours.

Fishers see themselves as incapable for struggling for their rights and for taking collective actions for improving their livelihoods without external interventions. Part of the reason is probably due to their low formal education and unfavourable financial conditions which, among other factors, has leaded them to social marginalization and to historically suffer of power abuse from authorities. Their experience with external actors has mostly been negative and in some cases disastrous. Ultimately they apparently view themselves as far from the social pattern that has been taught as desirable by mass media.

Their feeling of inferiority can be perceived in expressions such as "*they are big, we are small*", "*it all depends on what the big guys decide*" and "*one of their lies is worth a hundred of our truths*". A quote from an interviewee from the Farol village expresses their lack of trust in external interventions, "*we don't know who we can trust... it is hard to believe in somebody these days. You may be here saying that you want to help us but we don't know what you are really thinking, and you may want to take advantage somehow*". Lack of trust among fellow fishers is apparent in sayings such as "*fishers are the least united group that I know, one don't care about the others*" and "*a cooperative here would not work, first because we don't know how to deal with it, and second because all the time someone would have to take care for one fisher not cheat the others*".

Kalikoski *et al.* (2006) demonstrate that several successful cases of co-management involving fisher communities have included efforts to increase self-esteem and broaden the worldview of the population. Usually it is also necessary to take

measures for enhancing trust among stakeholders prior to the establishment of participatory arrangements. As an example, the organizations involved in the implementation of the Mamirauá Sustainable Development Reserve were able to gain the trust of the local community only after two years of work (Charity and Masterson 1999). Wells and Gawler (1999) points out that the process of trust building for preparing local stakeholders for participating in protected area management takes usually at least five years.

In cases in which capacity and trust building strategies are not enough for rising community self-confidence and trust in other stakeholders, additional efforts may make the difference particularly for determined groups within the community. In Mozambique, for example, old gear owners were involved in international exchange experiences to allow them to see by themselves how other communities successfully dealt with their problems by engaging in participatory processes (Chuenpagdee and Jentoft 2007).

### 8.1.4 **Fishers not used to participatory management**

Most of Peixe Lagoon fishers have lived most of their lives on the surroundings of this Lagoon, in a non-urban environment in which they have little interactions with people from other places. Participating in formal meetings and sitting down for hours for discussing and planning environmental conservation (or any other issue) definitely does not make part of their usual activities. "Fishers in Arraial do Cabo, as elsewhere in Brazil and beyond, live on the margins of organizational life... even basic participation in local formal institutions is extremely limited" (Pinto da Silva 2004, 423). Despite they affirm that they would be disposed to contribute for fisheries and protected area management, most fishers demonstrate to feel that planning and making decision which does not directly affect them should be done for those who are trained and paid for that.

Situations in which resource users without previous experience in political participation are launched suddenly as actors have showed to be unfortunate (Ferreira 2004). Stakeholders should never be forced to participate since only intentional participation is meaningful (Wells and Gawler 1999). Nevertheless local population can receive incentives for participation, such as the feeling that their contributions are significant and will bring benefits back to them. In addition to incentives they also need

to be appropriately prepared for engaging in participatory decision-making processes, which is for them an unusual kind of social interaction.

At first, community leaders who are more used to participate in multi-stakeholder bodies should be prioritized to receive incentives for participation and for representing legitimately the general opinion of their communities. Instead of bringing the community to a formal setting, decision-makers could also participate in the community life in order to understand their needs and to dialogue with them about their aspirations. Strategies for fostering participation, therefore, could be tow-fold, i.e. bringing community closer to the venue were decisions are taken and the other way around.

Another issue related to mindsets which is necessary to be addressed is the different understandings of concepts such as 'viable livelihoods' and 'environmental conservation'. Resource users and environmental agency officers may agree in doing environmental conservation which allows for viable livelihoods, but during the process of taking decisions they would probably find out that one group, or some individuals, would have a different conceptions than others.

Providing the environment for the dialogue among different world views and reconciling different interests are major challenges for the success of participatory processes. For that it is necessary that the attributions and requirements of be clear and understood by all participants, and that empathy and respect for diverse needs and values be nurtured (Mbile *et al.* 2005).

### 8.1.5 **Lack of basic knowledge about laws and fishers' rights**

During the first weeks of work in the field I was able to realize that a considerable part of the fishers and their relatives had very elementary doubts related to the National Park. Any academic could easily find answers for those questions just by doing a quick search about the Brazilian legislation on protected areas, but the local population who get along with the National Park for two decades still had doubts such as "*is it true that IBAMA wants to take us out of here?*" Adger *et al.* 2004 points out that the consequence of lack of institutional interactions makes communities to lack information and other essential resources that can not be missing in successful management systems.

How could they organize for struggling for their rights while they were not even sure that their livelihoods were being threatened? Would they know something about the

legal possibility of the creation of another status of protected area which allows for the sustainable use of resources? Would they understand what "sustainable use of resources" is, as it is stated in the legislation? Those doubts came to my mind, making me understand that provision of basic information and language adaptation are the first steps to be taken for community empowerment when it does not exist.

For that reason I organized a presentation about the Brazilian protected areas legislation, which I had the opportunity to present to the local communities twice: in the *Praia do Farol* village and in Tavares city[7]. The presentation had the tile "Rights and duties of traditional inhabitants of the Peixe Lagoon National Park area" and contained information such as the legal requirements of National Parks, the concept of traditional populations and their basic rights, and the existence of protected areas in which traditional and non-traditional populations are allowed to use resources and contribute for its management. The presentations were done using accessible language, and taking care for explaining all technical terms which could have raised doubts. Time for questions and discussion was provided, helping for increasing understanding of the presented topics.

That experience gave me another relevant insight: the presence of the researcher modifies the object of the study, and in some cases could modify it substantially. In this specific case, the researcher had a role of providing information which is basic for increasing local people awareness of their own situation and about possibilities for improving it. Nevertheless, that process of information exchange should be continuous, and in this sense NGOs and universities have failed in providing significant contributions to the local population.

The information provided in the above mentioned presentation should be still spread out, as there was still a considerable part of the concerned community which didn't hear about it. In addition, I could detect a great deal of other relevant information which would give local communities a better sense of their rights and awareness of opportunities for social development. Among the most significant subjects which could be presented and discussed are the possibilities for the establishment of partnerships with local and non-local groups and organizations (as presented in Chapter 6), reviewing of the rules applied to the inhabitants and resource users of the National Park, possible

[7] For more information check the Chapter 3 of this thesis, page 49.

impacts of fisheries over the local environment and suggestions for mitigation of negative impacts, and lessons from the experience of other communities which have had similar problems in other parts of the country and planet.

Future researches could include the role of informing local people about these and other relevant issues through many possible ways such as radio, newspaper, oral presentations in the communities, artistic exhibitions, folders, and so on. This task would also not be out of the responsibilities of local governmental organizations such as EMATER, municipal governments, and the National Park administration.

### 8.2 External Factors

The main external factors which currently would hinder the establishment of a participatory arrangement for protected area management are (1) History of conflicts, (2) Little institutional support, (3) Unwillingness of power holders, (4) Bureaucracy and legislation (5) Difficult to fit conservation institutions and environmental characteristics. This sub-section presents a discussion about these factors with considerations on possible solutions for them, as summarized in Table 20.

#### 8.2.1 **An history of conflicts interfering with trust and reciprocity**

Relationship between stakeholders is a fundamental issue in participatory arrangements. Since the creation of the National Park there has been a long history of conflict between the environmental agency responsible for its management and the local population, with periods of higher and lower tension. This conflict had periods in which material losses and even physical violence from both parts were frequent. Accounts from fishers and Peixe Lagoon Fishing Forum participants demonstrate that in the period before seven or eight years ago enforcement activities were done aggressively and with abuse of authority. As a fisher relates "*the enforcement staff used to arrive already pointing guns towards us*".

Local newspapers have a number of articles denunciating inappropriate behaviour of IBAMA enforcement staff, such as setting fire in fishers' boats and vehicles, and even breaking apart their houses (Jornal Freguesia das Aguas 2003). On the other hand, there are accounts of cases in which the fishers payback. In a certain occasion a National

Park's superintended had to leave the region as the conflict reached such intensity: fishers beat him up to the point of breaking his bones.

**Table 20: External factors hindering participatory management**

| Factors | Recommendations for solution |
|---|---|
| An history of conflicts interfering with trust and reciprocity | Sides in the conflict keeping to their word to further reciprocal trust; considering fishers as a positive, rather than a negative, force in the protected area |
| Lack of institutional support and partners | More effective leadership and networking to take advantage of existing partnership opportunities |
| Unwillingness of government to share management power | Government agencies understanding benefits, and necessity, of including communities in management |
| Rigidity of National Park status | Change the protected area status of Peixe Lagoon |
| Difficulty of Peixe Lagoon fishers to get the benefits of their own conservation actions | Preventing illegal fishers outside the lagoon from capturing the benefits of conservation; increasing dialogue between environmental agencies and fishers to enforce conservation strategies |

The way of dealing with each other has major consequences. It is important to recognize and to keep in mind that human beings usually respond according to the way they are approached. Despite the conflict has decreased today, the feeling of inferiority and of being considered invaders of their own lands still cause major constraints for the local fishers to interact with the National Park administration.

Fishers have complained that when they are caught fishing illegally they have been treated as criminals, and have to deal with the federal police in the state capital every two months, until their case is judged. A more adequate treatment would be required for creating a healthy relationship between the local population and the National Park administration before establishing a possible participatory management arrangement.

Chuenpagdee and Jentoft (2007) explain that hostility between fishers and government may be a major constrain for the establishment of platforms for communication and discussion. They still argue that the creation of participatory structures should ideally be established at the planning stage of the protected area as its acceptance is determined in early stages of implementation. In the case of the Peixe Lagoon, not only the initial implementation of the National Park created a bad impression, but also the subsequent two decades of conflicts.

The existence of conflicts in resource management is pervasive as there are usually several stakeholders with divergent interests (Lane 2001). Conflicts are not necessarily a bad thing as it constitutes a fundamental element for encouraging communities to self-organize and update their strategies of resource use (Simmel 1983 in Adomilli 2004). Therefore, for reaching positive outcomes from conflicting situations it is necessary to take actions for finding solutions and improving current conditions.

When agreement between stakeholders is difficult to be achieved, focusing on the establishing of better relationships and on trust building is essential for encouraging mutual collaboration (Chuenpagdee and Jentoft 2007). In the case of Peixe Lagoon fishers, they demonstrate to be more open to cooperative interactions when the National Park staff (a) respect them as similar human beings; (b) valorize their knowledge and contributions for taking decisions; (c) take decisions through consensus with the interested parties; (d) dialogue, providing information and explanations; (e) execute what they have promised; (f) show the environmental and social benefits of the decisions taken; and (g) provide agreed alternatives or compensation when decisions negatively affect the community.

Improving development variables is a strategy that has been used for increasing communities` acceptance to governmental interventions (Balint 2006). Responsive governmental agencies which offer tangible benefits for community avoid dissatisfaction and ease the establishment of trustful relationships (Dressler *et al.* 2006). Such benefits usually include improvements in the population life quality (e.g. improving educational and health systems) and increasing incomes. The later can be achieved through the creation of better conditions for commercialization and through more suitable management strategies which allows for growing resource stocks (Kalikoski *et al.* 2006).

### 8.2.2 **Lack of institutional support and partners**

As presented in Chapter 6 there has been insufficient institutional support for Peixe Lagoon fisher communities. The institutional interactions involving those communities do not occur as consequence of a search for it, but simply because most activities of the interacting institutions happen to take place at the same geographic area. Local organizations have had a limited role in providing assistance for improving fisher communities' quality of life and defending their interests of keeping inhabiting the surroundings of the Peixe Lagoon and maintaining their livelihoods. At the same time, organizations from outside the region also have had little influence over the organization and empowerment of local communities. Interests of external organizations in Peixe Lagoon region have been concentrated on the local environmental characteristics, and - in the best of the cases - on the information experienced fishers can provide.

Garcez and Botero-Sanchez (2005) identified that overall low technical and social assistance has been provided to small-scale fishers in Rio Grande do Sul State. In addition, lack of technical and institutional support for local resource users has been recognized as one of the major reasons that jeopardize the development of co-management strategies in Brazil (Kalikoski *et al.* 2006).

Solutions for this issue depend on initiatives for establishing connections and partnerships between the communities and institutions which are able to contribute for their organization, empowerment and development. As demonstrated in Chapter 6, there exist a considerable number of organizations in the local and non-local level which could include the Peixe Lagoon fishers in the scope of their attributions.

The initiative for establishing connections (and developing partnerships) could come both from the organizations or the fisher communities. However, fishers have not demonstrated to have interest in increasing the influence of external organizations in their region, due to their past and current negative experiences. A likely more successful attempt would be the development of a project for helping the local communities to establish connections and partnerships, and to be able to realize the benefits of it.

This happened for example in the case of Mamirauá, where the local resources users counted with the assistance of a group of researchers from the Mamirauá Civil

Society (Queiroz 2005a). They took the mission not only of fostering the establishment of interactions between the local communities with external stakeholders but also had the fundamental role of leading the modification of the protected area status, allowing for the inclusion of traditional resource users in the management of the new protected area, the Mamirauá Reserve of Sustainable Development (Queiroz 2005a).

### 8.2.3 **Unwillingness of government to share management power**

Until the end of this research IBAMA did not have intention of switching the status of protected area for one that allows the local community to maintain their ways of life and establish a partnership for environmental conservation. According to Diegues (2005), the creation of no-take marine protected areas in Brazil has been considered by the government as a sign of international prestige, even if it comes together with social marginalization and conflicts with local people, which is often the case.

An indispensable step for the establishment of a partnership with the local communities would be the implementation of a protected area that legally allows for participation. As National Parks in Brazil implies the removal of resource users, while this protected area status is in place and the legislation is not modified, small-scale fishers will be considered as a problem - and not part of the solution, as it could be.

Berkes (2007b) highlights that resistance of managers to deal with livelihoods and biodiversity conservation at the same time may be due to differences in agenda. It is also usually due to the incapacity and uneasiness of the environmental agencies to deal with multiple and complex objectives. Nevertheless, conservation issues typically occur in a set of social and ecological relationships which demands the ability to consider the aspirations of several actors and to deal with intricate problems.

Beyond the reasons above mentioned other causes for the environmental agency's unwillingness to include the traditional resource users in the management of the protected area may be speculated. Reluctance for giving power and strict preservationist thinking are probably two of those reasons. In regards to the first one, there has been little incentive for environmental agencies giving up control (Berkes 2002). In a point of view, it is easier to take decisions by themselves instead of sharing power with lay people, and be compelled to engage in a difficult and arduous process of joint decision-making.

Several examples of co-management demonstrate readiness for attributing responsibilities for resource users but lack of enthusiasm for genuinely sharing power for taking decisions (Kalikoski *et al.* 2006b). As put by Dressler and others (2006, p. 794), "Central governments also feel threatened by decentralizing their powers to local authorities for fear of losing control over 'state-owned' natural resources". This fear in many cases has been the reason behind the lack of political will to support co-management in Brazil (Kalikoski *et al.* 2006).

Such behaviour is not unexpected and has fair reasons for existing. On one hand, it has been argued that in co-management arrangements communities ideally should have the same level of power that the government does (Dressler *et al.* 2006). On the other hand, communities are rarely prepared to deal with such power, and not rare would use it for their own benefit, in detriment of environmental health. Therefore, the government has an important role of guaranteeing that principles of sustainable use of resources and environmental conservation be observed in protected areas. For this reason, the level of power devolution which would be considered fair and meaningful for the community is tricky to be found, and probably change according to the maturity of the community itself as well as the maturity of their relationship with the environmental agency.

The second major reason previously mentioned (strict preservationist thinking) has to do with values. Taking decisions related to environmental management is not only about technical expertise but inevitably involves value-choices issues to which managers bring their personal philosophical and political views (Lane 2001). Most of IBAMA's employees have a background in biology or ecology, lacking a social perspective. As explained by Diegues (2005), the vast majority of professionals and scientists dealing with MPAs have a biological background, particularly in the developing world.

In fact, the Peixe Lagoon National Park officials are mostly biologists. For that reason, they have convictions related to environmental protection which disregards possible contributions that resource users can bring to conservation. As consequence, the policy of implementation of the Peixe Lagoon National Park has been based on the consideration of the local population as 'nature aggressors' (Adomilli 2004). This idea is typical from the deep ecology philosophy (Naess 1972) which is behind the conventional protected area management field (Diegues 2000b).

Environmental and resource management in Brazil has a history of centralized governance, and most of the environmental governmental officials are not prepared for engaging in a participative management process (Seixas 2006). The pervasiveness of arrogance among those official, especially when dealing with illiterate people, is one of the major impediments for the formation of constructive connections (Dowie 2005).

For this reason, building reciprocal trust between conventional conservationists and resource users requires new approaches and skills, and a significant change in attitudes (Solton and Duldley 1999). In the case Instituto Chico Mendes decided to include the local population in the protected area management, it would be necessary to hire professionals capable to work with the community and/or preparing the current staff for that. Berkes (2007a) explains the necessity of capacity building among conservation practitioners for making them able to deal with multiple objectives and to truly consider the views and necessities of diverse stakeholders.

Different perceptions on concepts such as 'livelihood' and 'wildlife welfare' have leaded to confusion in negotiation processes of collaborative management (Lee 2003). It is necessary a great deal of patience, empathy and respect for reconciling different goals and achieve understanding on the needs and values of different stakeholders (Mbile *et al.* 2005). The presence of professionals with experience in community development would facilitate this process, furthering trust building and reciprocity (Balint 2006).

Therefore, including the traditional fishers in protected area management would be an arduous task as it requires the preparation of both the community and National Park staff for joint work. Although all the limitations the fisher community has, it would be relatively uncomplicated to 'convince' them for participation, as it would gives them the opportunity to maintain their livelihoods and the benefits from taking decisions together with the environmental agency. On the other hand, what would make Instituto Chico Mendes change their police of keeping a 'no-take' protected area?

Changes seem to be more prone to happen when necessity demands it. As the Peixe Lagoon fishers use to say, with indignation "*The National Park staff have their salary guaranteed in the end of the month... that is why they care so much about the nature and don't care about us. They do not know what to be in our shoes is*". It means that some change in benefit of the communities would probably only happen if there was

some reaction from the population such as protests and civil disobedience. Once more, that would require some level of community organization and institutional linkages and partnerships, confirming the urgency of concentrating efforts on it.

### 8.2.4 **Rigidity of National Park status**

The current legislation makes difficult to switch the status of protected area to one that allows communities to maintain their livelihoods and truly be engaged in resource management. The Brazilian legislation on protected areas (SNUC) provides possibility for the establishment of two types of protected area, which are called 'integral protection conservation units' and 'sustainable use conservation units'. The first type, which includes National Parks, does not allow any kind of exploitation of natural resources while the second type allows for their sustainable use.

Switching the status of protected area is possible, but SNUC have some requirements with regards to it. Sustainable use conservation units can be switched to an integral protection conservation unit through a legislation of the same status of the legislation which created the protected area. Most of the protected areas are established through a decree, which can be approved directly by the republic president. On the other hand, SNUC establishes that integral protection conservation units can only be switched to a sustainable use conservation unit through specific law. The creation and approval of a law requires a long bureaucratic process which goes through the Brazilian National Congress - a sector of the federal government with legislative attributions.

Not going through this process means the maintenance of what has been called, a 'paper park', i.e. a formally recognized park which does not fulfill the requirements of the protected area. 'Paper parks' usually take place when there is imposition of institutions and the responsible authorities have not enough capacity to manage it (Jones and Burgess 2005). Therefore, even with the bureaucratic barriers, the solution for this issue would be as simple as initiating the legal process of changing the type of conservation unit and passing through the required procedures.

### 8.2.5 **Difficulty of Peixe Lagoon fishers to get benefits of their own conservation actions**

The specific characteristics of the environment to be managed are important to be taken into account when analyzing what kinds of institutional interplay are necessary for making a management system successful. The size of the resource stocks, the level of exploitation suffered, accessibility to their areas of occurrence and the mobility of the resources are examples of factors which determine the necessary structure for carrying out resource management (Adger *et al.* 2005).

Peixe Lagoon is a semi-enclosed water body, allowing exchange of fishing resources with the ocean. This characteristic decreases the fishers' enthusiasm for applying resource conservation strategies, as the benefits of their efforts for conservation are transported to the sea where industrial vessels work. In closed water bodies, such as in the Mamirauá Sustainable Development Reserve, it makes more sense for fishers to apply conservation strategies, establishing quotas and separating certain lakes for fish reproduction, as the benefits of it return to the community (Queiroz 2005b).

Fishers would have more incentives for conserving Peixe Lagoon resources if the range of action of the environmental agencies fitted the level of occurrence of the fishing resources. Misfit between institutions and the level of occurrence of resources has been the cause of failure in several management systems (Folke *et al.* 1998, Cash *et al.* 2006). It would be necessary that the environmental agencies at different political levels developed arrangements and strategies for managing and conserving the fishing resources in all the levels they occur, and not only at protected areas. Seixas and Berkes (2004) highlighted the necessity of managing natural resources through strategies of conservation applied by institutions at several geographical and political levels.

Taking the pink-shrimp schools as an example, they migrate from Santa Catarina to Rio Grande do Sul State. It would make more sense for the resource users to conserve pink-shrimps at Peixe Lagoon if they had some indication that the pink-shrimps were being conserved in other areas where the schools migrate through, making possible the benefits of conservation to be felt back in the subsequent years.

For the creation, establishment and development of such cross-level conservation strategies, it would be necessary extensive research on the missing aspects of the life

cycle of the fishing resources, and continuous communication among the different offices of the environmental agencies responsible for managing fisheries in Southern Brazil. Such strategies are complex to be devised as the levels of political organization of the agencies rarely coincide with the levels of occurrence of resources (Berkes 2002). For this reason several authors have pointed out that interactions between the institutions responsible for governing resources have become more necessary than ever for dealing with current conservation issues (Seixas and Berkes 2003, Young 2002a, Adger 2003).

### 8.3 Brief comparison with the Brazilian general scenario

Kalikoski *et al.* (2006) made an extensive revision on the literature about the state of the art of co-management of natural resources in Brazil with special attention to fisheries. Part of the results was related to the identification of the main factors that have hindered the development and success of co-management arrangements in the country. The revision of 116 references demonstrated that the most cited negative factors are: (1) conflicts of interest inter and intra-scale; (2) marginalization of fisher communities; (3) financial restrictions; (4) little social cohesion of communities; and (5) lack of trust from the resource users in governmental agencies.

As demonstrated in this chapter, all of those reasons also apply for the case of the Peixe Lagoon National Park. Several stakeholders at different political and organizational levels have conflicting interests related to the use, occupation and conservation of Peixe Lagoon area. Even the two traditional fisher communities have had some divergent interests, which has been poorly addressed due to their difficult cohesion and unity. Marginalization of these communities is evident as they have received limited support from external organizations and have been considered as a menace to the local environment by the National Park administration.

Financial restriction is also present both for the environmental agency to manage the protected area and for the communities to develop strategies for defending their rights and interests. Even considering the possibility of the environmental agency to include the fisher communities in the management of the protected area, the limited financial resources would be a barrier for enabling communities and training officials for participating in a collaborative process.

Young (2006) pointed out that the prioritization of management strategies based on the western scientific knowledge in detriment of local practices is likely to make environmental agencies to lose credibility and to become distrusted by local communities. As reciprocal trust is the 'oil' for the well-function of any participatory 'machine', the existence of mistrust between stakeholders is an important constrain for developing a collaborative protected area management in the Peixe Lagoon region.

# Chapter 9 - Conclusions

> "*Far more important than modeling the ideal design of marine protected areas... is building local social and community support for them. This is a lesson that has sometimes escaped the most ardent academic promoters of the marine protected area conservation strategy*"
> (Kareiva 2006, R534)

## 9.1 Revisiting Thesis Objectives

In regards to the first objective of this thesis to investigate community self-organization, local institutions and resource management strategies, it was possible to identify a number of practices that help the fishers to make a living but at the same time help maintain wetland processes. These were regulated by locally devised informal institutions. Some of the resource management strategies were regulated by ephemeral institutions with sporadic self-organization which are apparent from time to time but disappear at other times.

Nevertheless, there are two management strategies that have been in place for a relatively long time, regulated by non-ephemeral institutions: the control of fishing spots and the annual opening of the Lagoon mouth. The control of fishing spots has been in place for decades, helping to avoid fisheries over-exploitation. The Lagoon mouth management has been carried out for centuries, as a strategy for fisheries management. Opening of the Lagoon mouth ensures periodic draining of the wetland, indirectly contributing to the maintenance of biodiversity and the environmental conditions necessary for migratory birds.

It can be argued that the latter management strategy has become part of the local ecosystem dynamics. To change or end such activity could cause considerable alterations in the Peixe Lagoon wetland system, affecting biodiversity and the habitat and food availability for migratory birds. However, the ecological benefits of the Lagoon mouth opening and the control of fishing spots have not been recognized by the National Park administration. IBAMA actually demands the withdrawal of local fishers from the protected area without the evidence that their activities have damaged ecosystems or bird populations. The present work documents that fishers have for long time harmoniously

co-inhabited the region with the migratory birds, corroborating the findings of previous research (Resende and Leuweenberg 1987).

In general the fisher communities have had little incentive to manage the area or for self-organization because of insecure resource rights. As a consequence, the current level of organization of the fishers does not allow them to take actions that meaningfully affect their own future. There are few people who could be considered potential leaders, but they are not recognized so by most fishers. These leaders have had little capacity for mobilizing the community. In fact, there were very few occasions in which they were able to mobilize a considerable number of fishers for joint action.

Second objective was to examine community's own agenda and concerns for the protected area. It was possible to recognize that although the beach fishers and urban-based fishers had slightly different agendas, the top priority of both communities was the same: maintenance of livelihoods (100% of respondents). For the beach fishers, living inside the protected area (72%) and their children having access to fishing resources (56%), were also top priorities. As fishers have only temporary permits to work and live within the protected area, they did not have a feeling of ownership of resources. Therefore, they were mostly concerned with short-term resource use objectives, instead of trying to address future problems, such as working to change the protected area status of Peixe Lagoon.

According to the present work, most fishers considered participating in fisheries management was very important or top priority (100% of beach fishers and 82% of urban fishers). It was clear that fishers' top concerns and priorities were related to their livelihoods, and therefore their view of 'relevant' management did not include the protected area. Still, a strong minority considered that their participation in protected area management was very important or top priority (48% of beach fishers and 37% of urban fishers). Involving fisher communities in the broader collaborative work with the environmental agency demands that fishers are able to perceive clearly the concrete benefits from participation. In my view, that would only be possible if people had incentives to manage the Lagoon and participate in government management. One mechanism to achieve this would be to change the status of protected area to allow fishers to maintain their livelihoods.

Concerning the third objective to explore institutional linkages, both at the local level and across levels of organization, it was found that the fisher communities had very few linkages. However, good opportunities were identified for further developing existing interactions and establishing new ones. Institutional support for Peixe Lagoon fishers was limited, but it nevertheless enabled them to defend their access to resources which sustain their livelihoods.

New connections could be established horizontally with other communities of resource users, such as those of the Patos Lagoon, and vertically with organizations, especially governmental organizations created for supporting traditional populations. Those organizations could assist communities to become better informed, more organized and with a higher level of cohesion, and therefore more prepared to engage in participatory management.

It is essential that organizations which work with the fisher communities are committed to comply with the expectations created by their presence. That is, those organizations must plan for a long term relationship with the community, building reciprocal trust and empathy. This is necessary for the fishers to become more receptive to their interactions and therefore able to benefit from it. The local community experience with external interventions has often been frustrating, not only in the case of the National Park creation, but also in interactions with researchers and NGOs when fishers' expectations were raised but not fulfilled.

For this reason it is imperative to tackle the problem of inconsistency and uncertainty in the behaviour of governmental agencies. There has been an issue of lack of continuity in the implementation of policies and programs which are the responsibility of agencies such as IBAMA. It is essential that long-term plans are cautiously devised for increasing the changes of successful implementation of a participatory protected area management. At the same time, it is important to reconcile the policies adopted by different governmental agencies. For example, environmental conservation and protection of traditional peoples' culture and knowledge seem to be contradictory policies in their current implementation but should not be so.

### 9.2 General Conclusions

An analysis of the Peixe Lagoon social-ecological system reveals that some ecosystem processes are closely related to traditional activities. Thus the protection of such activities is important to keep the linkages between fisheries and environmental conservation. One mechanism to achieve that would be to switch the status of the protected area from National Park to either Extractive Reserve or Sustainable Development Reserve, as provided by the Brazilian National System of Conservation Units. Allowing fishers to become involved in protected area management should be a strategy to (1) empower fishing communities, (2) gain local support for conservation, (3) lower the enforcement costs, and (4) improve management through the incorporation of traditional and local knowledge. Scientific knowledge should also be used to complement fisher knowledge. If fishers were permanently allowed to live and work in the protected area, as allies to the environmental agency, they could also greatly help to improve enforcement of conservation measures.

The National Park management has been hampered by a lack of resources, which is not rare in Brazilian protected areas. Experience shows that the success of environmental and natural resources management depends to a large extent to the acceptance and support of local communities, especially when there is lack of resources for management (Jentoft 2000). Adopting a cooperative approach by giving the community responsibilities for participating in the management of the protected area would encourage them to collaborate with the environmental agency and to develop a stewardship attitude towards the use of resources. That is in accord with a widespread trend towards decentralization and the promotion of public-private partnerships in support of more democratic approaches.

In contrast to what can be achieved through participatory approaches, the current conflict between the National Park administration and the local population is jeopardizing conservation implementation in the protected area. The current policy that excludes the traditional population not only wastes the opportunity to take advantage of their knowledge and resource management strategies, but also leaves them no option but to oppose the protected area itself. The ability of Instituto Chico Mendes to manage and enforce the protected area properly will be even more severely threatened as soon as the

traditional fisher communities are forced to relocate. The fishers would not only be compelled to fish illegally, but they are likely to respond with hostile actions against the National Park, as they have done in the past as payback for mistreatment.

It is necessary to critically address the question about how the presence of the fisher communities threatens or complements conservation objectives in the Park. Even if there are some negative impacts, they do not seem to be significant (Resende and Leuweenberg 1987). Indeed, it is likely that the costs for either mitigating or avoiding them would be far lower than the costs of relocating the population and enforcing protected area rules.

### 9.3 Participation and changing protected area status

If the status of protected area were changed to allow livelihood maintenance and meaningful engagement of fishers in management, it would take great effort to prepare not only the user-group but also environmental agency officials to work collaboratively (Pomeroy and Berkes 1997). Reconciling different worldviews and value sets is *sine qua non* for the establishment of a participatory management approach (Lane 2001). It is a difficult task, as it demands the transformation in the way people and institutions reason and behave. Although the development of a participatory approach would be arduous and time consuming, it is possibly the most promising way to achieve sound biodiversity conservation in a socially responsible manner.

One of the clearest findings of the present thesis is the lack of community empowerment. Measures for empowering fishers might include increasing organizational skills, cohesiveness, and the creation, development and strengthening of leadership and local institutions. If there is opportunity for participatory management, community organization is essential (Berkes *et al.* 2001). If there is no such opportunity, then that organization becomes still more important. It would give them the chance to have more possibilities of choice about their own future, either related to continue relying on fisheries for livelihood or not.

If a participatory management approach is to be implemented, it is vital to further trust-building, collaboration and creating rapport and reciprocity between the communities and the environmental agency (Berkes 2007b). Planning is necessary for the

long-term management of the protected area. In fact, it has to be kept in mind that results are not going to be quick, requiring commitment and perseverance. Assigning the fishers with the roles they are willing to play is a starting point. Such roles may be modified according to the interests of the community as it becomes more mature in regards to organization and common objectives.

Preparing protected area staff to work cooperatively with the traditional communities is a basic step to be taken. Current officials would have to be trained to become more familiar with social sciences and to engage in participatory management. To hire professionals with experience in those fields would be of great value. The recruitment of social scientists who can speak both the language of the environmental agency staff and the language of the community would facilitate the negotiation processes which are the basis of participatory approaches. Those professionals would increase their effectiveness as mediators as much as they are able to identify the values and worldviews lying beneath stakeholders attitudes.

As the availability of resources seems to be a pervasive issue, looking for partnerships at different levels of organization would facilitate the implementation of participatory management (Carlsson and Berkes 2005). Organizations such as universities and NGOs may provide relevant contributions. Developing projects for empowering communities, acting as mediators or contributing with diversity of knowledge and technical expertise are examples of those lines.

Participatory processes work effectively when there is mutual willingness for contributing to the other parties, and when the anxiety for achieving self-interests does not predominate. It is also important that the participants realize the benefits of participation and that decisions be made through agreement as much as possible, to avoid frustration. When consensus is not reached, providing compensation for losses may be considered for alleviating dissatisfaction. In addition, it is essential that the participants feel their inputs are valuable. As long as the interested parties few they have been respected and the other parties effectively consider their necessities, they become more flexible and more prone to collaborate.

For participation to be meaningful and to generate positive outcomes for management, it is necessary that the fishers have incentives to participate in management.

To do so would require that fishers have more secure rights and resource tenure. Under the current status of the Peixe Lagoon National Park, the fishers only operate with a temporary license and have no security of resource use into the future. Related to that, the fishers need to have more power and some capacity to negotiate. This includes having access to relevant information and certain autonomy for taking decisions. The problem of difference in power among stakeholders must be addressed, ensuring that participation is equitable, while at the same time ensuring that principles of conservation and ecological sustainability are respected.

A way to minimize environmental impacts and decrease conflicts regarding decision making is to develop a zoning plan for the protected area, with core protection zone where preservation is priority and mixed use and protection zones, where resource users have more autonomy to apply their own management strategies. Other zones may be reserved for additional activities such as recreation and tourism related activities.

If resource use is going to be allowed, monitoring the protected area would be essential to guarantee the sustainable use of resources. Fishers may be involved in such monitoring as they have daily interaction with the Lagoon and its surroundings. Yet, it is important that scientific research be also carried out and the results discussed in appropriate language with the local communities. Such knowledge is a necessary part of empowering communities for active participation in management, as opposed to merely participating in meetings (Berkes 2007a).

Finally, while a participatory approach for protected area is not yet developed in the Peixe Lagoon region, it is very worthy to continue carrying on researches that take into account opportunities to empower the local communities and establish strategies of protected area management fitting the Peixe Lagoon context. Such researches should provide relevant information for the communities, make them think more deeply through their problems and realize the existence of opportunities for improving their conditions, and enable them to actively participate in resource monitoring. Joint research and monitoring also has the potential to make protected area administrators review the issues from different perspectives. As in collaborative management, local people are more likely to participate in research and monitoring when they realize the benefits of doing so, and have resource rights to be able to take advantage of these benefits.

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## Appendix 1: Peixe Lagoon Fishers Interview Guide

### INTERVIEW GUIDE - FISHERS

**Opportunities for co-management in the Peixe Lagoon National Park**

**Researcher**: Tiago Almudi **Date**: _____
**Interviewee**: _____ **Village/city**: _____

**Consent (basic information)**

- Research purpose: to explore opportunities and difficulties of the integration of traditional fishermen of Peixe Lagoon in the National Park management.
- Themes of investigation: organization of the fishermen communities, their aspirations related to their future in the park, and institutional relationships with influence in the park management.
- Expected length of the interview: around 1 hour
- No information will be used in a way that may put at risk the integrity or security of the interviewee.
- Return: I intend to validate the research findings with the participants in the next months (August and September).

**For the interviewee to fill up**

☐ yes ☐ no 1) I consent with the use of a voice recorder by the researcher

☐ yes ☐ no 2) I consent with the researcher taking notes during the interview

☐ yes ☐ no 3) I permit that my name and my phrases be literally cited by the researcher and understand that it will allow others to recognize me (Please feel free to answer this point at the end of the interview)

☐ yes ☐ no 4) I permit that my phrases be literally cited but I do not want my name to be revealed (Please few free to answer this point at the end of the interview)

☐ yes ☐ no 5) I would like to receive a written copy of the research findings

**1. Community organization**

*1.1. Formal and informal institutions and leadership*

1) What are the organizations formed only by fishermen?

1.a. How are they structured? Who the leaders are?

1.b. What their main role is?

1.c. How and why they were created?

2) What organizations exist to assist or represent the fishermen interests?

2.a. How are they structured? Who the leaders are?

2.b. What their main role is?

2.c. How and why they were created?

3) With which organizations do the fishermen have some relationship? What facilitates and what hampers these relationships?

4) Who are the fisherfolk leaders and representatives in this community?

4.a. How do they execute their work? With which organizations they work with?

5) In which external organizations are the fishermen represented?
(Who are the fishermen representatives in the Forum, Advisory Council, etc?)

6) How legitimate is the representation of the main leaders and representatives of this community? (Look at the leaders and representatives from the inside and from the outside of the community)

<u>7) Lagoon mouth opening</u>

- How does it work?
- Who organizes it?
- How (when, why) does this process started?

*7.1. Funding and other resources*

7.a. Was there some funding to create some community organization? Who provided?

7.b. Was there some other help (courses, services, free use of facilities, etc)? Who offered?

*7.2. Knowledge (Note gender)*

7.c. Who has the knowledge and authority about these issues? (Note whether there is external or only local knowledge)

8) Control of the shrimp fisheries

- How does it work?
- Who organizes it?
- How (when, why) does this process started?

*8.1. Funding and other resources*

8.a. Was there some funding to create some community organization? Who provided?

8.b. Was there some other help (courses, services, free use of facilities, etc)? Who offered?

*8.2. Knowledge (Note gender)*

8.c. Who has the knowledge and authority about these issues? (Note whether there is external or only local knowledge)

9) Control of the fishing areas in the lagoon and sea

- How does it work?
- Who organizes it?
- How (when, why) does this process started?

*9.1. Funding and other resources*

9.a. Was there some funding to create some community organization? Who provided?

9.b. Was there some other help (courses, services, free use of facilities)? Who offered?

*9.2. Knowledge (Note gender)*

9.c. Who has the knowledge and authority about these issues? (Note whether there is external or only local knowledge)

10) Are there other kinds of informal organization/institutions? Do the fishermen have rules among themselves? How does it work?

## Appendix 2: Peixe Lagoon Fishers Quantitative Questionnaire

# QUESTIONNAIRE - FISHERS

**Opportunities for co-management in the Peixe Lagoon National Park**

**Researcher**: Tiago Almudi **Date**: _____
**Interviewee**: _____ **Village/city**:_____

**1. Community aspirations**

1) Would you like to live/continue living inside the National Park?

□ Yes □ It doesn't matter □ No Why?

2) Would you like to continue fishing inside the park?

□ Yes □ It doesn't matter □ No Why?

3) Would you like that your children were allowed to fish inside the park?

□ Yes □ It doesn't matter □ No Why?

4) Would you like that everybody were allowed to fish inside the park?

□ Yes □ It doesn't matter □ No Why?

5) Would you like to have more freedom to fish as you want in the park? (Ability to increase fishing effort)

□ Yes □ It doesn't matter □ No Why?

6) Would you like that some facilities, or better conditions, were brought to the park's area (Electricity, better roads, etc)?

□ Yes □ It doesn't matter □ No Why?

7) Would you like that the National Park existed if the fishermen were not forbidden to work and live inside it?

□ Yes □ It doesn't matter □ No Why?

8) Which of the following activities would you be willing to carry out if you were permanently allowed to fish and live in the park?

* Official enforcer □ Yes □ Maybe □ No

| | | | |
|---|---|---|---|
| | □ Related to fisheries | □ Not related to fisheries | □ Both |
| * Provide information to the official enforcers | □ Yes<br>□ Related to fisheries | □ Maybe<br>□ Not related to fisheries | □ No<br>□ Both |
| * Research (monitoring) | □ Yes<br>□ Related to fisheries | □ Maybe<br>□ Not related to fisheries | □ No<br>□ Both |
| * Assist in decision-making | □ Yes<br>□ Related to fisheries | □ Maybe<br>□ Not related to fisheries | □ No<br>□ Both |

What else?

9) Mark according to the level of importance

| | Top priority | Very important | Important | Little important | Negative |
|---|---|---|---|---|---|
| Living inside the park | | | | | |
| Fishing inside the park | | | | | |
| Ability to increase fishing effort | | | | | |
| Better conditions for the park area (electricity, roads) | | | | | |
| Fishers' sons be allowed to fish inside the park | | | | | |
| Participating in fisheries management | | | | | |
| Assist in the park management (other issues) | | | | | |
| Having alternative sources of income | | | | | |

## Appendix 3: National Park Officials Interview Guide

### INTERVIEW GUIDE – NATIONAL PARK OFFICIALS

**Opportunities for co-management in the Peixe Lagoon National Park**

**Researcher**: Tiago Almudi **Date**: _____
**Interviewee**: _____ **Organization:** Instituto Chico Mendes

**Informed Consent** [8]

**1. Functions and institutional organization of the Peixe Lagoon National Park**

1.1. What is the organizational structure of the Peixe Lagoon National Park?

1.1.1 How does it work? (Logistic, financial and human resources)

1.2. How is its internal hierarchy structured?

1.2.1 Who are the leaders? What are their main activities?

1.3. What is the hierarchical relationship with IBAMA (or Instituto Chico Mendes) at the state and national level?

1.4. What are the sources of funding for the National Park?

1.5. What are the main functions/responsibilities of the Peixe Lagoon National Park office?

1.6. How and why this National Park was created?

1.7. What are the main difficulties faced for managing it?

**2. Interactions with Peixe Lagoon fishers**

*2.1. Advisory Council of the Peixe Lagoon National Park*

2.1.1 Who participates in the meetings?

2.1.2 Do the fishers participate? How many of them?

2.1.3 Who does represent them?

2.1.4 Is this representation legitimate?

2.1.5 How frequent are the meetings?

[8] A written informed consent form was handed in for the National Park officials who were interviewed

2.1.6 Which subjects are usually touched? What have been the issues on discussion in the last meetings?

*2.2. Fisheries in the Peixe Lagoon National Park*

2.2.1 What are the requirements for a fisher to get the official permission to fish inside the National Park?

2.2.2 How the opening and closing of the fishing seasons are decided?

2.2.3 Have the fishers been able to provide inputs for those decisions? How?

2.2.4 What are the rules for the fisheries in the National Park? Do the inhabitants of the National Park are under specific restrictions? What are them?

*2.3. Opening of the mouth of the Peixe Lagoon*

2.3.1 How the date for opening the mouth of the Lagoon has been decided?

2.3.2 Do the fishers participate in that decision? How?

2.3.3 Who effectively opens the connection between the Lagoon and the ocean (i.e. who makes the physical job)?

**3. Institutional Relationships**

3.1. With what institutions the National Park administration has more interactions? What kind of interactions? (Government, NGOs, universities, etc – pay attention to power relations)

3.1.1 at the local level

3.1.2 at the state level

3.1.3 at the national level

3.1.4 at the international level

3.1.5 With which institutions the relationship is more cooperative and with which institutions the relationship is more conflictive?

3.1.6 How did those interactions start?

3.1.7 There have been done some researches in the National Park area? (Make a list of them)

**4. Co-management**

4.1. Would a protected area co-management be possible in your opinion?

4.1.2 What would be the main barriers?

4.1.3 What are the reasons why this is a National Park instead of a conservation unit of sustainable use according to SNUC classification?

4.1.4 Would a conservation unit of sustainable use be a better option in your opinion? Why?

4.1.5 What are the main challenges to be tackled if a co-management arrangement was established? (What would be necessary to change for it to be established?)

5) In which of the following activities do you think the fishers could assist the National Park administration if they were allowed to live and work in the protected area?

| | | | |
|---|---|---|---|
| * Official enforcer | □ Yes<br>□ Related to fisheries | □ Maybe<br>□ Not related to fisheries | □ No<br>□ Both |
| * Provide information to the official enforcers | □ Yes<br>□ Related to fisheries | □ Maybe<br>□ Not related to fisheries | □ No<br>□ Both |
| * Research (monitoring) | □ Yes<br>□ Related to fisheries | □ Maybe<br>□ Not related to fisheries | □ No<br>□ Both |
| * Assist in decision-making | □ Yes<br>□ Related to fisheries | □ Maybe<br>□ Not related to fisheries | □ No<br>□ Both |

What else?

## Appendix 4: Institutional Officials Interview Guide

### INTERVIEW GUIDE – INSTITUTIONAL OFFICIALS

**Opportunities for co-management in the Peixe Lagoon National Park**

**Researcher**: Tiago Almudi **Date**: _____
**Interviewee**: _____ **Organization:**_____

**Informed Consent** [9]

**1. Functions and institutional organization**

1.1. What is the organizational structure of the *name of the organization*?

1.1.1 How does it work? (Logistic, financial and human resources)

1.2. How is its internal hierarchy structured?

1.2.1 Who are the leaders?

1.3 Does it report to other hierarchical levels (e.g. state and national)?

1.4 How is it maintained? What are the sources of fund?

1.5 What are their main functions, responsibilities and policies?

1.6 When does it started to work in the Peixe Lagoon region?

1.7 What are the main difficulties faced at the local level?

**2. Interactions with Peixe Lagoon fishers**

2.1. How does this organization interact with the local fishers?

2.2. What is the importance of this organization for those fishers?

**3. Institutional interactions**

3.1. With what institutions does this organization have more interactions? What kind of interactions? (Considers government, NGOs, universities, etc – pay attention to power relations)

3.1.1 at the local level

3.1.2 at the state level

[9] A written informed consent form was handed in for the institutional officials who were interviewed

3.1.3 at the national level

3.1.4 at the international level

**4. Co-management**

4.1. Would a protected area co-management be possible in your opinion?

4.1.2 What would be the main barriers?

4.1.3 What are the reasons why this is a National Park instead of a conservation unit of sustainable use according to SNUC classification?

4.1.4 Would a conservation unit of sustainable use be a better option in your opinion? Why?

4.1.5 What are the main challenges to be tackled if a co-management arrangement was established? (What would be necessary to change for it to be established?)

## Appendix 5: Presentation to fishing communities

### RIGHTS AND RESPONSIBILITIES OF TRADITIONAL POPULATIONS IN THE PEIXE LAGOON NATIONAL PARK

**June 2007**

By Tiago Almudi
Researcher on Natural Resources Management
University of Manitoba, Canada

**Presentation Outline**:

1) Introduction of concepts
2) Introduction of the main legislation concerning protected areas in Brazil
3) Introduction of relevant legislation for traditional populations
4) SNUC objectives and guidelines
5) Types of protected areas within SNUC
6) Requirements of National Parks
7) Protected areas compatible to the presence of traditional populations
8) Examples of protected areas with traditional populations in Brazil

→ Questions are welcome during the presentation

→ Time for discussion will be provided at the end of the presentation

**1) Introduction of Concepts**

**Natural Resources Management**: is a fan of activities that aim for the sustainable use and conservation of natural resources such as water, fisheries and forest.

**Traditional Population**: "Groups culturally different and that recognize themselves as such. They have own ways of social organization, using and occupying territories and natural resources as condition for their cultural, social, religious, ancestral and economic reproduction. They utilize knowledge, innovations and practices generated and transmitter through tradition" (definition given by Decree 6.040/07)

"Groups that live in a certain territory for many generations and that depend on the use of natural resources for livelihood. They usually utilize relatively simple tools for resource extraction, causing little negative impact on the environment" (my simplified definition)

**Conservation Units**: a territory regulated by law for the protection of the environment and its natural resources

**National System of Conservation Units (SNUC)**: the Law 9.985/2000. It provides the guidelines for the creation and management of all the types of conservation units in Brazil.

**2) Legislation on protected areas**

- Law 9.985 established in 2000 (SNUC)
- Decree 4.340 established in 2002 complements articles of SNUC.

**3) Legislation related to traditional populations**

→ Decree 6.040/2007 establishes the National Policy for the Sustainable Development of Traditional Peoples and Communities

- The main purpose of this National Policy is to promote the sustainable development of the traditional communities, emphasizing the recognition of their territorial, social, economic and cultural rights.
- Specific objectives include: protect their traditional knowledge and practices; support the development of their institutions; and solve or minimize the conflicts between traditional communities and the implementation of conservation units.

**4) Objectives and guidelines of SNUC**

- The main objective of conservation units is to protect the environment and its natural resources

Additional objectives:

- promote sustainable development (i.e. the use of the resources in a way that the environment can support)
- further scientific researches and environmental education
- protected the resources which traditional populations depend on for livelihood, recognizing and respecting their knowledge and culture.

Guidelines:

- local populations must be involved in the creation, implementation and management of conservation units

- traditional populations must have access to the resources they depend on for livelihood inside conservation units, or alternative ways of subsistence or proper compensation

**5) Types of protected areas within SNUC**

There exist two groups of conservation units:

1) Integral protection units: the direct use of natural resources is not allowed. Direct use is the extraction of resources (examples: cutting trees or fishing)

2) Sustainable use units: the direct use of natural resources is allowed under certain rules.

**6) Requirements of National Parks**

National Parks is one of the integral protection units, and therefore no extraction of resources must be allowed.

- What happen in this case?

SNUC - Art. 42. Traditional populations must be compensated by their losses and properly relocated. Until it does not happen they have the right to stay in the conservation unit. The environmental agency must regulate their activities without hindering their livelihoods and ways of life.

Decree 4340 – Compensation and relocation must respect the ways of life and sources of subsistence of the traditional populations; only the people that were living in the conservation unit when it was created will have the rights to compensation.

**7) Protected areas compatible to the presence of traditional populations**

However remember the objectives of SNUC... "further sustainable development", "incentive local population to participate in conservation unit management" and "recognize and respect the culture of traditional population"

→ If those principles are to be respected, a change in the status of conservation unit is necessary for the case of the Peixe Lagoon.

→ Although there is a long bureaucratic process to switch a integral protection unit into a sustainable use unit, it is possible according to SNUC.

**Extractive Reserve:** is a sustainable use unit with the main objectives of protecting the livelihoods and culture of traditional populations and guarantee sustainable resource use.

**Sustainable Development Reserve**: is a sustainable use unit with the main objectives of environmental conservation in areas occupied by traditional populations which have devised traditional resource management strategies.

SNUC - Art. 23. The permanence of traditional population in both of those conservation units is conditioned to the respect to regulations which guarantee environmental protection in the conservation unit.

**8) Examples of protected areas with traditional populations in Brazil**

Today there are 82 Extractive Reserves and 15 Sustainable Development Reserves in Brazil, most of them in the Amazon.

→ One example in Southern Brazil is Marine Extractive Reserve of Pirajubaé in Santa Catarina state.

→ Mamirauá was an Ecological Station (which is an integral protection unit). Due to local organization of the ribeirinho communities, with the support of external organizations such as the Catholic Church, they were able to switch the status of conservation unit. In 1996, Mamirauá Ecological Station became Mamirauá Sustainable Development Reserve. Studies have showed that the lakes managed by the local population with the support of the environmental agency have presented increasing fisheries production (Queiroz 2005).

→ Time for questions and discussion

NOTE: During most of the discussions that took place after the presentation, the participants asked me a number of questions. Most of them were questions such as "what do you really think is going to happen with us? Do you think IBAMA is going to make us leave the Park soon? Do you really think it is possible to change their minds?" They thought I would somehow have a better perspective about what is going to happen. They also asked me to do what I could to help them defend their livelihoods and access to work and live inside the protected area.