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## **Artisanal Fisheries at Paraty: Challenges and Conflicts for the environmental Management**

**Sessão Temática: Conflitos Ambientais.**

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### **Resumo**

O manejo de recursos naturais constitui um importante tema de pesquisa para os estudos da economia e a organização social desempenha um papel chave para a sustentabilidade, envolvendo diversos aspectos incluindo a administração e os direitos de propriedades. Os conflitos com comunidades locais são considerados os maiores desafios para o manejo das áreas protegidas em Paraty. Neste artigo, a pesca artesanal é apresentada a partir da jurisdição legal e da potencialidade para o uso sustentável dos recursos, apontando para alguns conflitos. A visão teórica no qual está baseado é a Teoria dos Comuns (Ostrom, 1990). Defendemos que os acordos de pesca configuram uma ferramenta criativa para acabar com o impasse entre autoridades e pescadores em face de mecanismos de crise e devemos ter em mente a questão de como evitar efeitos negativos de políticas de regulação verticais, de forma a programar sistemas de comanejo que beneficiem todos os atores e ajudem na prevenção da extinção de espécies de peixes. Finalmente, argumentamos que é essencial dar mais voz aos Caiçaras no processo de tomada de decisões, especialmente durante o processo de recategorização que estão em andamento no presente momento.

**Palavras-chave:** Pesca, Manejo, Paraty, Áreas Protegidas.

## **Abstract**

The topic about the natural resources management is an important subject of research within the economic study. The social organization is a key factor for the sustainability and, in this specific subject, there are several matters that involve the administration of natural resources and property rights. Conflicts with local communities are considered the biggest challenges on the management of Paraty protected areas. On this paper the artisanal fisheries are presented regarding legal jurisdiction and the potentialities for the sustainable use of the resources, pointing some conflicts. The theoretical view in which this paper is based is the Commons Theory (Ostrom, 1990). We defend that fishing agreements consist in a creative way to break an impasse between authorities and fishers concerning crises mechanism and we should have in mind the question on how to avoid mistakes made by a top-down regulation, in a way to implement a successful comanagement system that benefits all the stakeholders and help to avoid the extinction of fishes' species. On the conclusion we can argue that it is essential to give the Caiçaras more voice on the decision-making process, especially during the recategorization process ongoing in the present moment.

**Key words:** Fishing, Management, Paraty, Protected areas.

## **1. Introduction**

The municipality of Paraty, in Rio de Janeiro, is home of one of the last fragments of the Mata Atlântica, a biome that suffer strong anthropic pressure due to its location on the most human developed region in Brazil. Because of the strong presence of the Caiçaras communities among the coast, it could be inferred that they're responsible for the historical conservation status – above the average for Atlantic Forest environments. In the past, they've lived on a basis of fishing and the sustainable management of the forest, thus to study these activities is a way to understand the alternative strategies for the environmental management on this region.

The Caiçara descend from the Portuguese colonizers, indigenous inhabitants and Africans slaves, and they have also been influenced by the Japanese fishing culture. They have been long dated inhabitants of the Atlantic Forest and lived in contact with the external actors, working with the local economy, but their survival relied mostly on the resources from the forest and the sea-shore, practicing a low-scale agriculture and fishing. Their traditional propriety rights regime uses the family bonds as parameter - for sharing the territory, the gear and the flower-houses – but due to the imposition from the

government conservation agents their traditional culture have changed, because of restrictions imposed by regulators since most of the areas that they live in have been declared as conservation unities by the authorities (Begossi, n.d.; Begossi, 2006).

To exploit the natural resources, the local populations use a detailed knowledge of nature, called in literature as “local ecological knowledge” (LEK), among another definitions. The LEK can be defined as the set of knowledge and know-how regarding the natural world, apprehended through observation and experience and transmitted orally from generation to generation. The study reinforces the idea that biodiversity management ultimately means a relationship of knowledge and action between local populations and the resources of biodiversity (Berkes e Folk 1998; Diegues, 2000).

Furthermore, Begossi use the term cultural flexibility to frame the evolutionary behavior of their culture, related to the economic flexibility in such a way to enhance the ecological resilience – for instance, during the 1950’s, they changed from an agriculture based economy to a fishing based economy to answer changes in the market. This author also compare the Caiçaras with the Caboclos from the Amazon Forest - another neotraditional population that share many aspects related to the tropical forest knowledge and cultural values- but highlights that the Caiçaras have comparatively lower ability to deal with external actors, such as politicians, scientists and government agents that could strength the ability to innovate along with the changing scenarios. Differently from the Caiçaras, the Cablocos own a past of political struggles and had many successes on the process of fighting for the rights to explore their resources. On the other hand, the political organizations of the Caiçaras are much younger and have yet much to be developed to work in order to enable the sustainable development (Begossi, n.d.).

According Noaks (n.d) this is a time of uncertainty and change for fisheries management; the only thing certain is uncertainty. It is a time of unprecedented change, of shifts in concepts and priorities. The global climate is changing, perhaps as a decadal shift. Native species are becoming endangered at what appear to be unprecedented rates. Exotic species are invading with potentially catastrophic consequences for individual native species and communities. Harvests of wild fish stocks are declining. The demands on fisheries and aquatic sciences are ever increasing, from an ever-increasing number of individuals, organizations, agencies and nations.

In this toward, Thébaud et al (2017) detach the MSEAS 2016 symposium in Brest, France, which discussed with a lawyer, a modeller, an economist, a social scientist and an ecologist about how to solve many problems facing marine ecosystems around the world

and understand marine socio-ecological systems. In this time, was discussed the challenge of explicitly considering the human component in producing synoptic assessments of marine social-ecological systems and management the resources. Finally, the meeting fostered dynamic debates on the inter-disciplinary collaborations needed to support management of ongoing and anticipated growth in multiple ocean uses, with particular consideration of the triple bottom line of ecological, economic and social sustainability.

On this paper the artisanal fisheries are presented regarding legal jurisdiction and the potentialities for the sustainable use of the resources, pointing some conflicts. The theoretical view in witch this paper is based is the Commons Theory (Ostrom, 1990).

According to OSTROM (1990) the problem involving many cases of excessive use of natural resources is how to limit this use in an optimum way to guarantee the economic viability on the long term. Those who claim for central regulation, privatization or the regulation by those parties involved on the use of the resources, have recommended different policies based on their view, but this problem is not better developed among the academia or the political surroundings. What can be inferred is that neither the State nor the market itself can guarantee that individuals will use the commons in a sustainable way on the long term. Furthermore, some communities have been supported by institutions that are not part of the market or the government to ensure governance of the natural resources with some degree of success through long periods.

Therefore, the cooperative management have been debated internationally by the academia, because it can be seen as an alternative and more efficiently than the traditional management tools, such as centralization and privatizations (CALDASSO, 2015). Thus, fishing agreements consist in a creative way to break an impasse between authorities and fishers concerning crises mechanism – such as over-fishing and lack of political authority. Generally, fishers demand power on the decision making process because government authorities have been proven not been able to solve the problems regarding the management, pointing to lack of data and even the ability to worsen the situations (PINKERTON, 1989). Government authorities also mistrust the fishers, who could be seen as predators or as fallen angels that will eliminate all the resources and act against the conservation if restrictive measures are not elaborated (PINKERTON, 1989; IDROBO et. al., 2015).

In recent study, Faraco et al (2016) stress that different communities and households show heterogeneity in many of the factors that compose vulnerability to a decline in fisheries. The authors demonstrated that there were negative impacts on the

avored strategies for households with low and medium adaptive capacity restricted by the existence of no-take protected areas. This type of result stress the need to consider differences in livelihoods and vulnerability when planning conservation and development actions, included the protect areas.

Finally, according to those ideas exposed on the following paper we should have in mind the question on how to avoid mistakes made by a top-down regulation when dealing with conservation units that are home to artisanal fisheries communities, such as the areas surrounding Paraty, in such a way to implement a successful cooperative management system that benefits all the stakeholders and help to avoid the extinction of fishes' species. Some of the answers for this questions could go along with the possibility to enhance the compliance in order to drive a good behavior by the most affected users that require more involvement on the decision-making process (LOPES et.al. 2013) and changing the design of some protected areas in order to make it feasible for the communities to live in such protected areas (LOPES et.al. 2015).

## **2. The Historical Mismanagement on The Long Term.**

Brazilian legislation concerning the fishing has been changing since the first Code on Game and Fishing – Federal Decree N° 23.672 – stated in 1934. At the same year the Federal Decree N° 24.643 known as the water code defined the common water's. Already in 1938 the Code on Game and Fishing was dismembered to a Law-Decree N°794 and again in 1967 was substituted to another Law-Decree N°221- The Fishing and Water Code (Araújo et.al. 2014). Even though the juridical parameters was established by The Fishing and Water code, until the 1960's the planning of fisheries were not recognized on the majority of the fisher's communities due to its isolation status on small urban centers or inshore isolated communities, in which many inhabitants haven't had contact with the cities, unless for those cases of selling part of its production or for accessing the health care system (DIEGUES, 1983).

Until the 1960's the management of the fisheries was a responsibility for The Game and Fishing Services, belonging to the Department of Animal Production that was subordinated to the Minister of Agriculture. From 1962 to 1989 the SUDEPE - Superintendence of Fishing Development- was responsible for the management and had the focus on the development of the industrial fishing by means of tax breaks, which has

led many non-fishers to adventure on the exploitation of this market, or using the resources available for these means on other economic activities not related to the fishing. By its 12th birthday, the SUDEPE had 10 different leaders - none of them related to any kind of fishing activities, industrial or artisanal – fact that show that even when the fishing was in its boom, there was a lack of strategic plan for the sector (DIEGUES, 1983; DIAS-NETO, 2003; ARAÚJO et. al. 2014). The industrial focus of the SUDEPE, led to a big increase on the catches during the decades from 1960 to 1980, and so to a situation of overexploitation, inappropriate to the long-term sustainability resulting in the growing scarcity over the years (ABDALLAH & SUMAILA, 2007).

From 1989 to 1998, the IBAMA was the only federal body responsible by the fishing sector, created with the goal of centralizing the management of the natural resources within the Minister of Environment. In 1998 the Department of Fishing and Aquaculture (DPA) was created within the Minister of Agriculture, and then, from 1998 to 2003 the management and development roles were divided among these two organizations. In 2003 the SEAP – Special Secretary for Fishing and Aquiculture – was created in substitution of the DPA, related directly to the President Cabinet and dividing the management roles with the IBAMA. Later in 2007, the IBAMA was dismembered and the ICMBio – Institute Chico Mendes for the Biodiversity – was created to be responsible for the management of the protected areas, including the surveillance, monitoring and actions for the conservation of the biodiversity. So, the IBAMA got the roles to be the environmental police, licensing and control for the environmental quality and the authorization for the use of renewable natural resources in terms of the Federal Law N° 11.516 (ARAÚJO et. al. 2014).

In 2009, after the creation of the Minister of Fishing and Aquiculture (MPA) by the Federal Law N° 11.958, the fisheries were managed both by the MPA and the IBAMA. The roles of those two organs has been oriented by production – by the MPA – and conservation – by the IBAMA – but also by politics of territorial management, such as the Policy for Territory of Fishing and Aquiculture from the MPA (ARAÚJO et. al. 2014). Nowadays, there are more than 140 legislative instruments that rule directly or indirectly the fisheries management in the municipality of Paraty, on the federal, district and municipal levels (ARAÚJO et. al. 2014).

Recently, another institutional change has involved the management of the fisheries. On 2016, the MPA was dismembered by the former president, Dilma Rouseff, and the role for the fisheries was distributed to the Minister for Agriculture, Livestock and

Supply on September 20th, 2016 By the Decree nº 8,852(BRASIL, 2016). Furthermore, the political instability have once more changed the institutions and since March 13th, 2017 the president cabinet, now controlled by Michel Temer, has declared the Decree nº 9.004 which states that the Minister of Industry, International Trade and Services would be responsible for the sector (BRASIL, 2017).

Richards & Foran (2016) appointed that the negative impacts of the food security and fishing crisis will be felt across sectors: health, economic and cultural impacts on coastal communities will put even greater pressure on the budgets and resources of national governments as they deal with these impacts and they will flow across many sectors including health, trade and tourism. The authors stress that because coastal fisheries production is unlikely to expand in the future, the relationship between coastal fisheries and poverty will revolve around preserving existing welfare benefits through effective fisheries management.

In the case of Brazil, revising the history regarding the roles of the institutions responsible for the management of the fishing since its begun in 1934, we can then, infer that a long-term plan for the public policy undoubtedly is very compromised by irregular changes on the direction it goes, mostly because of revisions made by the top-down regulator, what has made very difficult for the communities to keep up with the changes that has big impact on their day-by-day actions.

### **3. Territorial Management and Conservation Unities in Paraty.**

In 2000 the National System of Conservation Unities (SNUC) was created, and in the document stipulated two groups of categories, the Integral Protection Unities and the Sustainable Use Unities. The goal for the first ones is the preservation of the natural environment, and the second category contemplate the goal of making feasible the conservation with the sustainable use of the natural resources (BRASIL, 2000). The State of Rio de Janeiro is home for 208.037 hectares of Integral Protection Conservation Unities and 244.319 hectares of Sustainable Use Conservation Unities, not included the private reserves of natural propriety (RPPN's) (INEA, n.d.). Paraty is surrounded by conservation unities, and major parts of those are designed for the forestry preservation, due to the fact of having one of the last fragments of the Atlantic Forest biome. Those conservation unities affect not only the terrestrial use, but also the shores and water because of the damping zone in such a way that all of the communities and their fisheries would fall into

some restriction if all the rules from those unities were in fact enforced (LOPES et. al. 2014).

The concept of territory is a wide and important object for the relations between the traditional communities and the nature, in which it relates not only with the exploited areas but also, reflect the social relations that exist. For the traditional fishing communities the territory is much wider than for those living in ground. Differently from the concept of the urban-industrial societies, their territories are discontinuous and marked by apparently empty places (resting plots, estuaries used for fishing only in certain seasons, and because of this aspect sometimes they are treated as unused and declared by authorities as conservation unities for forest preservation and this is one of the sources for the existing conflicts between those traditional communities and the conservation authorities (DIEGUES, 1996).

Generally, the conservations unities, utilize the management plans, the municipal directional plans and the agendas 21 as instruments for the territorial management. Those three instruments have some common objectives, but they have different levels of jurisdiction and comprehensiveness, in a way that different stakeholders and methods are assigned by each instrument resulting on a source for friction for a uniform and integrated management (ARAÚJO et. al. 2014).

For some conservations unities in Paraty, those plans are very new or inexistent, which is the case for the Juatinga Ecological Reserve, which takes all the peninsula and its home for several important traditional communities, such as the Pouso da Cajaíba- the main port used by the Caiçaras, for its position inside a bay, protected of the open sea- and Martim de Sá - one of the favorite places for young backpackers and tourist, that generate incomes for its inhabitants. This absence of management plan is not the only problem in this reserve, other two problems that made it necessary the recategorization for this area are also the fact that its category (Ecological Reserve) is not complained by the National System of Conservation Unity (SNUC) and the superposition with the Environmental Protected Areas of Cairuçu (ARAÚJO et. al. 2014).

#### **4. The Bocaina Mosaic.**

Due to the Article 6 of the Federal law nº 9.985/200 when there is a set of conservation unities with different categories or not, next, juxtaposed or superimposed and other protected areas public or privates, building a mosaic, the management of this set should be made in an integrative and participative way, considering the different goal of



conservation, in a way to allow the presence of biodiversity, the valorization of social-diversity and the sustainable development in the regional context (BRASIL, 2000). Furthermore, by the ordinance nº349/2000 of the Minister for the Environmental (MMA), in its first article recognize the Bocaina Mosaic, regarding all its conservation unities located on the Valley of the Paraíba do Sul, on the south shore of Rio de Janeiro and north shore of São Paulo. In Rio de Janeiro, under the authority of the IBAMA, there are the National Park of the Bocaina Ridge (Parna Serra da Bocaina), the Ecological Station of Tamoios (ESEC Tamoios), the Environmental Protected Area of the Cairuçu (APA Cairuçu); under the authority of the FEEMA/SEMADUR, are the Environmental Protected Area of the Tamoios (APA Tamoios), the Biological Reserve Praia do Sul (REBIO Praia do Sul), the Marine District Park of the Aventureiro (Parque Estadual Marinho do Aventureiro); and by the Authority of the Secretary of Environment, Fishing and Aquiculture of the prefecture of Paraty is the Environmental Protected Areas of the Bay of Paraty, Paraty-Mirim and Saco do Mamanguá (BRASIL, 2000).

Therefore, all the Conservation unities that occupy the territory of Paraty are part of the Bocaina Mosaic that covers 14 municipalities, 19 conservation unities, six indigenous territories and four Quilombola Communities Territories (ARAÚJO et. al. 2014). So, this mosaic could allow an integrated system for territorial information, in a way to allow the surveillance of use and occupation on all the protected areas, but this integration among all the different institutions for the regional management of the areas, are nothing but an ideology, because it runs into the private yearnings and the federal bureaucracy that prevent its implementation (ABIRRACHED, 2011).

According to Faraco et al (2016) adaptive capacity is difficult to study empirically as it is a latent ability, which is only mobilized in response to impacts. Few studies have connected predictors of adaptive capacity to empirical observations of adaptation behavior in the face of disturbances. The authors hypothesized that fishers' vulnerability and adaptive capacity to declines in catches will vary by communities due to different livelihood composition and proximity to protected areas. In an empirical study in 9 villages from Barequeçaba, in Paranaguá Estuarine Complex, they conclude that protected areas, if not adequately managed, can have a double negative effect on more vulnerable households, by restricting their access to mangrove resources in the present, and by limiting the viability of their favored adaptation strategy for the future.

So on, the existence of big Conservation Unities in Paraty represent at the same time the conservation for the shore ecosystems and the restrictions for access and withdraw

of the marine resources, creating conflicting situation along fishers and managers and in this case, these conflicts are aggravated by the divergent views concerning the formal rights and the informal appropriation of the fishing resources. While the State claims the right over the conservation unities stated jurisdictionally, the Caiçara argue, otherwise, for its communal appropriation rights of the sea shore (ARAÚJO et. al.2014). This resemble the fact that many Marine Protected Areas (MPA's) have been established since 1979 but just recently the attention has shifted to their users, many times seen by the agencies responsible for the monitoring and enforcement as wrongdoers, although to meet the success in conservational goals the presence and empowerment of the fishers and other users can be seen as very important aspects (LOPES et.al. 2013).

Furthermore, these users can be seen as active agents for the conservational purposes, as seen in Begossi(2001) and Begossi (2006) the fishing spots in many communities haven't changed over the period of 10 to 30 years at least due to clear informal rules spread among the traditional communities that have avoided the over-exploitation and have excluded outsiders. In addition, the idea of local knowledge is very important on the literature and it is strongly related to the territories (RUDDLE & DAVIS, 2011; BEGOSSI, 2001). So, to maintain the stability and preservation of those areas, such as the claim of the governmental agents, it is inevitable to maintain the cultural and social spaces of the traditional communities and to guarantee that the de facto rules would not change randomly over time.

## **5. Perspectives and Conclusions.**

The dynamic on the process of management of fishing in Paraty is wide and complex, in such a way that some institutional tools overlap others in which the role of the fishing are in vogue and on others it has a secondary view. In the Fishing Planning this is the center of attention for the decision making, but for the Territorial Planning it has a secondary attention, but one is very affected by the other (ARAÚJO et. al. 2014). So, to institutionalize a model of participative management that combines conservation policies, social inclusion and local development is a great challenge due to the complexity of politics in Brazil and the fact that the instruments for planning the sustainable management are widely based on the mutual trust between the agents involved (ARAÚJO et. al., 2014; OSTROM, 1990).

So, we can observe that although the legal instruments to ensure the preservation of the Caiçara culture does exist, in that daily action for the conservation reside a factor for

exclusion of these actors, by means of coercion of their tradition. This is observed by the lack of decision-making power given to them by the legal authority and also by the fact that many times they don't agree with the legitimacy of the actions made by these authorities. If in one hand, the authorities are trying to avoid the use of resources based on command-and-control policies, in the other hand, they don't give the necessary power to the most involved agents in this situation. This situation could be seen theoretically by the creed on a big central agency to regulate in a way to avoid the tragedy of the commons, as seen in OSTROM (1990). Although nowadays it is well known by the academia that the creed on the tragedy of the commons disregards preconceived arrangements such as those made by the traditional communities.

Another fact that could be seen in this research is the high degree of cultural changes evolving on the traditional communities. These changes could be the result of the high level of command-and-control policies -stronger until the 1990's - that has disabled the opportunities to those traditional practices, forcing them to adapt their habits to impositions due to conservation goals and creating a necessity to rely on other activities, (e.g. fishing and tourism) - the prohibition of controlled fires to open spaces on the forest, for instance, made the itinerant agriculture a harder practice – and these changes have enlarged the pressure upon the fisheries, due to the necessity to create income for suppressing the economic needs (CALDASSO,2015; BEGOSSI, n.d.).

So, in order to achieve a more viable strategic for the conservation of those conservation unities that own a high level of ecological resources we can infer that some co-management tools should be applied as a mean to aggregate the participation of the Caiçaras in those actions for the conservation. The importance of their participation, not only resembles on the fact that they are long dated inhabitants of these areas, but also the fact that they own great local ecological knowledge and their presence could be seen as a source for lowering the cost on monitoring, and retrieving data, as seen widely on the literature regarding co-management systems. Furthermore, we could see that the lack of management during the historic process of categorization of those conservation unities has caused many problems to those communities regarding territorial conflicts and making pressure on their resilient culture, so in order to avoid the continuity of this process, it is essential to give the Caiçaras more voice on the decision-making process, especially during the recategorization process that is going on in the present moment in many conservation unities around Brazil.

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