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CONSERVATION UNITS: A SUSTAINABLE PROPOSAL FOR THE MANGROVE SWAMPS OF GARGAÚ, TOWN OF SÃO FRANCISCO DO ITABAPOANA/ RJ, BRAZIL

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1 INTRODUCTION

Brazil's 7,408-km coastline borders the Atlantic Ocean (CIMA, 1991). The country ranks second in size and first in wetland cover in Latin America (SCHAEFFER-NOVELLI, 1999). Most of the country's population live along the coast, site of most activities and use of natural resources. Today the human occupation of the Brazilian coastline is a serious issue, for it promotes the generation and discharge of solid waste and household wastewater into the country's mangrove swamps, estuaries and coastal areas. In this environmental setting, mangroves play a relevant role in providing livelihoods for the original communities and in keeping up the balance of a number of systems of the biosphere (ROCHA, 2013).

Mangrove swamps are found in estuaries and coastal lagoons, and usually come into contact with the sea or an upstream fresh-water source (SOFFIATI, 2014). They are home to complexes of pioneer river-sea vegetation and consist of halophyte plants[3] mostly the size of a shrub that can reach tree size. Such system, as a whole, has a low variety of vegetable species. The major taxa, unique to this biotype, are the red

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[3]**Halophytes** are species living in salty environments (extracted from the book Manguezais: educar para proteger. Rio de Janeiro: FEMAR: SEMADS, 2001. page 86).

mangrove (*Rhizophoramangle*), the white mangrove (*Lagunculariaracemosa*) and the black mangrove, also known as the *siriúba* mangrove (*Avicennia germinans* or *avicennia shaueriana*) (AVELINE, 1980).

In Brazil, the mangrove ecosystem extends from the Northern latitude of 4º 30', the mouth of the Oiapoque River in the State of Amapá, up to the Southern latitude of 28º 30' in Laguna, State of Santa Catarina (SOFFIATI, *Op. Cit*). The State of Rio de Janeiro has an extensive mangrove area of approximately 720 ha sited in the estuary, close to the mouth of the Paraíba do Sul River (SOFFIATI, *Op. cit.*). The Gargaú district is part of this area. Most of its inhabitants earn a living by picking crab/shellfish and catching fish (ROCHA, 2013).

These sites are regulated by the Brazilian Legislation and are listed as Areas of Permanent Protection or APP (BRASIL, 2012). Despite that legal protection, the mangroves of Gargaú's estuary are adversely impacted by the cut-down of mangrove trees and the discharge of household sewage and industrial waste into sink holes or onto the river bed itself (SOFFIATI, *Op. cit.*).

In his studies of this area, Soares (2005) also points out the formation of a dam on the right border of the Maré canal out of the material generated from the dredging of the canal by the once Brazilian Department of Construction Works and Sanitation (DNOS). It was meant to ease the navigation of mid-size fishing boats. However, it turned out to be a hurdle to the tide shifts required to keep the mangrove swamp alive, something that today is carried out by the Instituto Estadual do Ambiente (INEA). That significantly impacts the water regime of the mangrove swamp, affecting its fauna and flora (SOFFIATI, *Op. cit*.; VIEIRA, 2007) while causing the opening of grazing lands and the use of this ecosystem's areas to put up houses. The cited authors say these factors have been restraining the purpose of the estuary, and contributing to the depletion of the environment. They also bring on losses to local inhabitants. Large pipelines carry the sewage produced by the local community into the canal feeding mostly the Buraco Fundo mangrove swamp (ROCHA, 2013).

All these factors create a setting of pollution in the estuary, compromising the health of the mangrove swamps and, in a domino effect, the ability of locals to keep their native culture and their livelihood. We suggest that a diagnosis study be performed to assess how feasible it is to set up a Conservation Unit (CI) of the

Sustainable Use group (BRASIL, 2000) in well-preserved estuary areas, which is the major aim of this research.

Conservation Units are protected areas that make up the Brazilian System of Environmental Protection. They are controlled at federal level by the Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) and make up the Brazilian System of Nature Conservancy (SNUC), established by Brazilian Law 9,985 of July 18, 2000 (BRASIL, 2000) and made enforceable by Brazilian Decree 4,340 of August 22, 2002 (BRASIL, 2002).

2 ON THE AREA UNDER STUDY

Figure 1 – Map of the use and occupation of Gargaú, town of São Francisco do Itabapoana, RJ, Brazil. Source: Sala Verde, Instituto Federal Fluminense (IFF), 2007.

The town of Gargaú is part of the estuary of the Paraíba River, in São Francisco do Itabapoana/ RJ. It has a dry subhumid climate, without excessive water, and a good distribution of heat along the year. The temperature varies from 15 C to 31 C, with an average temperature of 23 C and an average rainfall of 916 mm, mostly during the spring and summer seasons. (MENEZES, 2010).

Among the six coastal cities and towns sited in upstate Rio de Janeiro, the town of São Francisco do Itabapoana is home to most and largest mangrove swamps (SOFFIATI, 2007).

In July 2012, historian Mário Menezes said that from 1934 to 1935 the village of São Francisco was crossed by mangrove swamps in the lowlands and sandbanks in the

upper lands. “Back then employees of the local administration used to cut out the mangrove vegetation to *‘clear up the area’ and fight off the mosquitos that jumped on people as they walked through on their way to the beach*” (ROCHA, 2013).

3 METHODOLOGY

Our research includes the collaborative design of alternatives to simultaneously preserve the ecosystems and recognize the rights of the inhabitants of Gargaú. Two (2) field tests were carried out in the community of Gargaú on July 18-19, 2014, when we randomly picked 30 consumers of the “offspring” of the river and the mangrove swamp and asked them to fill up a semi-structured questionnaire, with 18 questions, divided into multiple-choice (10) and open questions (8). Our goal was to raise the social and economic situation of this population and find out their perception of the negative impacts to the environment that had been occurring in the area and the feasibility of making it a Conservation Unit (UC) to better protect the estuarial area. The used methodology allows for free and straightforward answers, thus empowering the respondents for their thorough knowledge of the area's ecosystems.

4 FINDINGS AND DEBATE

The focus of the semi-structured questionnaire was the environmental perception of the offspring of the river and the mangrove swamp and their social and economic importance for the livelihoods of the local population. A hundred percent (100%) of the perception of the negative impacts were obtained by watching natives at daily work. They reported deforestation (73.3%), household sewage (56.6%), the improper discharge of trash (26.6%), the discharge of fish and shrimp remains into the river's branches (23.3%) and the past discharge of chemicals into the river (20.0%) as the major impacts, among others.

The upshot of this study substantiates their thorough knowledge of the ecosystems and their awareness that the environmental damage can lead to the future lack of natural resources from the river and the mangrove. This could compromise their capability to keep up their livelihoods, because 50% of the respondents are fishermen and 47% shellfish pickers. Because 60% of both classes have not completed their basic education, they depend on the “offspring” of the area's ecosystems.

The questionnaire also pointed out that 83.3% of inhabitants do not know what a Conservation Unit is. That may explain the low social engagement and why the debate over the technical feasibility of the proposal to create the CU has been going on for 25 years but has never been carried out by public authorities. This study has evidenced the need to raise public awareness of the CU, its groups and categories, to enable further social engagement by those that are most affected by the clash of economic growth and the preservation of natural resources.

Previous academic studies (SOFFIATI, 2014; ROCHA, 2013; SOFFIATI, 2007; VIEIRA, 2007; SOARES, 2005) point out the environmental impacts on the ecosystem of the Gargaú area and the creation of a CU to mitigate the problem. However, so far this environment goes on being depleted. We recommend that a study of the mechanisms to implement a CU in the estuary of the Paraíba do Sul River be performed on an urgent basis, starting from Gargaú, and as a result of this study, include the neighboring areas affected by the same problems.

5 FINAL REMARKS

Aside from technicalities, this study unveils that locals must participate in the design of strategies to implement the integrated protection of the ecosystems and the populations depending on them to survive. Otherwise, environmental bodies will fail to counteract the environmental depletion resulting from the fast growth associated to the big-size construction projects in place or planned to be erected along the coast of the State of Rio de Janeiro. The self-recognition of the interviewed dwellers as local population and their local, traditional knowledge of the ecosystemic management of the mangrove swamp, evidenced during the interviews, point at the need to consider creating a CU of Sustainable Use to ensure the replication of the living habits of the crab pickers and the fishermen living in the Gargaú area.

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